COAL AGE

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"NO Solicitors Allowed." The next time you run across that sign tacked to the side of some cock-sure individual's desk, just gaze about and notice how tired, unimportant looking are most of the subordinates who surround him. You see it works out like this:—

The Thing that makes for success in business these days is interest: No, it's not the money variety, but plain every-day interest in the thing that one is doing. Just get in contact with some fellow who is interested in his work and you will understand why. Now can you picture any surer way to arouse your employees' interest than to allow well-posted salesmen (solicitors if you insist) to hobnob with them, swap experiences, and incidentally relate how last week they cut Jones' operating cost in two and in doing so put one over on a competitor who had been knocking them coming and going.

In these days the bulk of all sales are the direct result of personal solicitation. A manufacturer desiring to market a new type of mine pump, hoisting engine or what not, casts about for some bright young fellow who has had experience with existing types of similar machines and is familiar with their limitations. The young man is invited to the factory and treated to a personally conducted tour through the shops, and as the various types of new machines are explained to him, he is given opportunity to express his opinions, and if they and his actions indicate that he has become an enthusiastic believer, he is turned over to the sales manager and given an opportunity to become sponsor for the new machine.

What is the result?

This young fellow, brimful of enthusiasm, saunters forth distributing information. By the time he has followed such work for a year or two, he is competent to offer suggestions covering all sorts of conditions and he does it in a way (thanks to his training in salesmanship) that precludes hard feelings. He doesn't do this for glory, but only to obtain a hearing; and as soon as he feels sure of his ground, he works up data to prove just how much his machine can be expected to improve existing methods and reduce costs.

Of course his figures are treated lightly at first, but by the time the Big Boss at the factory writes back and offers to back up the estimates with a guarantee, you begin to realize that it is time to get serious. At any rate you have become interested and eventually you will find you cannot be happy until you are able to give the new thing a trial.

But says the "no-solicitors-allowed" individual, there are so many fellows who are selling things without merit and they take up more of your time than do the others. Just so; the fellow who is selling something that has small merit realizes that he must confine his dealings to men who are easily dominated. When he spots such an individual protected by a "no-solicitors-allowed" sign, do you suppose that he throws up his sponge; if you do just read one of the numerous autobiographies of successful book agents and make another guess.

Enter now the man who has been employed to sell a thing of merit. He sees the "no-solicitors-allowed" sign and turns on his heel. There are so many men in his territory who are open to conviction that he considers it poor judgment to sit about in ante-rooms waiting for office boys to decide whether or not he should be classed as a solicitor.

His minutes are also precious, and he is employed to spread interesting information without any waste of the prospective purchaser's time. And, remember, he gains nothing unless he proves that his product will be valuable to the mining company.

So the moral is: Change the "No Solicitors Allowed" sign to read "Intelligent Salesmen Welcome."

[*This foreword was written by a former coal-mine manager.*]

Wastefulness in Anthracite Preparation

By Eli T. Conner

The awakening of American engineers and business men to the importance and profit of conservation and of scientific efficiency in the performance of all manner of industrial activities is highly commendable. The results are seen not only on the balance sheet, but in the broadening mental vision of the principals directly interested, as well as of the rank and file.

Earnest efforts to achieve the best results in the mining and preparation of anthracite coal have resulted in gratifying success in bettering older methods, especially in preventing degradation of sizes at the collieries of some of the producers. The success of some wide-awake managers and their staffs, however, serve but to emphasize the "moss back" quality of others who seem satisfied to go on using methods which, to speak mildly, are antiquated survivals of a less enlightened age.

The great desideratum in preparing anthracite coal is to handle it in such a manner as to produce the greatest possible amount of the larger sizes, viz.: grate, egg, stove and chestnut, with the least possible percentage of smaller coal and dust. The great increase in yield of major sizes resulting from careful attention to the design and speed of rolls as compared with former practices, is well shown in the paper which was read by Paul Sterling, mechanical engineer, of the Lehigh Valley Coal Co., before the American Institute of Mining Engineers, in June, 1911, at the Glen Summit meeting. The improved methods pointed out by Mr. Sterling have not been generally adopted, though the ideas are being put into effect by some producers.

But there are other wasteful practices tolerated which also result in large losses. Many chutes in breakers are set on too steep an angle, so that the coal sliding down at too great a velocity strikes against right-angle turns and reverse chutes with excessive violence thus causing needless breakage. The methods by which these right-angle and reverse chutes are installed in many cases remain the same as those of 40 years ago.

There is no attempt to ease the moving coal around the turn and so it strikes with sharp blows against the sheet-iron sides of the chutes. In attempting to correct this evil, a prominent operator, Frank Pardee, discovered the principle of the "spiral separator," which under some conditions, has been found very serviceable in removal of slate.

This reference brings out another source of waste. Some types of separators, depending on friction and the difference in weight of slate and coal, are so arranged that the coal is severely punished by striking against edges of sheet iron and dropping violently against hard substances, causing excessive breakage.

It is also true that as much as 30 per cent. of good coal may be found in the waste sent to the spoil banks or being pulverized and flushed into the mines. The coal thus washed in to fill empty chambers can never be recovered. Under no circumstances should the material wasted or flushed contain more than 5 per cent. of combustible matter and even better results can be attained. Such inexcusable waste as is now common is entirely due to lax or inefficient management.

The old idea of many coal men that fuel used at the mines costs nothing, and therefore need not be considered in the cost sheets, is entirely erroneous. Fuel at anthracite plants should be regarded in the same manner as at well managed bituminous mines, where it is charged to operating cost at the price for which it might be sold in the market.

This system has not, so far as I know, been adopted at any anthracite plants, but it should be. The carelessness in the matter of fuel at the mines results in many instances, in consuming large quantities of pea, or Nos. 1 and 2 buckwheat when nothing but the smallest and least valuable coal should thus be consumed.

Instances are known where large producers are thus permitting coal to be burnt in their own plants, carrying 50 per cent. of coal larger than No. 2 buckwheat.

These reprehensible practices are largely due to the "good enough" attitude of those in charge of many of the companies, to their mental and physical indolence, and to their disinclination for self analysis and self criticism.

When a human being reaches the state where he thinks he cannot improve, he is thenceforward retrograding, for there is no such thing as standing still. We must either progress, or we will surely go backward.

The Design of Coal Screens

By Benedict Shubart*

The results of practical experience applied to screen design in difficult cases. Several different types of perforations are described and their use and arrangement for handling different amounts and kinds of coal are discussed.

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Mr. Pfening's article in COAL AGE of Sept. 14, suggests that possibly others have encountered the same difficulties that the writer has found in designing and operating coal-screening plants for various conditions. Unfortunately it is not possible to standardize coal-screening plants and tipples, although very frequently the writer has been asked by a prospective operator why he cannot put in a standard plant, such as others have installed.

Of course, the designing engineer knows that no two plants are alike, for no two have exactly the same tonnage, location, market, quality of coal, yard arrangement, percentage of given sizes of coal, number of different grades desired, combinations or mixtures of different sizes, sizes and types of coal cars and box cars to be loaded, etc. Of course, several mines may have any number of these in common, but a difference in any one of the essential factors will entirely change a given screening layout.

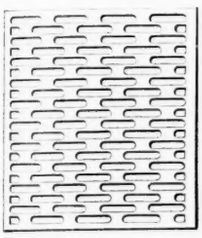


FIG. 1. ELONGATED PERFORATIONS

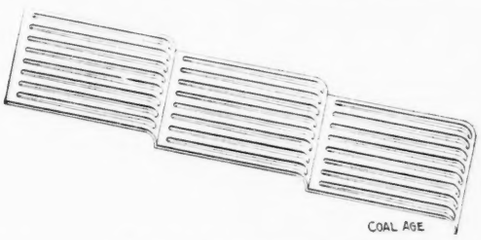


FIG. 2. SO CALLED LIP SCREEN

In this article I will not go into the general question of screen design, but will merely illustrate a few types and modifications which I have found useful under difficult screening conditions.

In the first place, unless the mine has previously been operated so that the screening qualities of the coal and the troubles incident thereto have been thoroughly learned, it is unwise to so construct the screens that it is impossible to make changes and adjustments. Reasonable leeway must be provided, for, in few cases, is it possible for the designing engineer to make more than an approximate guess as to how the coal will behave.

Another fundamental point which must not be forgotten is to arrange for an even feed. When the entire contents of a pit car is dumped on the screens, if the coal is inclined to break flat, a large percentage of the slack and nut will ride down on top of the large pieces and be loaded into the lump car, causing complications well known to the sales department.

This can be partially avoided by the installation of a feeder either of the reciprocating or conveyor type to take the coal from the dump hopper and deliver it evenly onto the shaking screen. This is, in my opinion, an essential part of the equipment under any conditions where more than 500 tons per day of coal are to be passed over one screen.

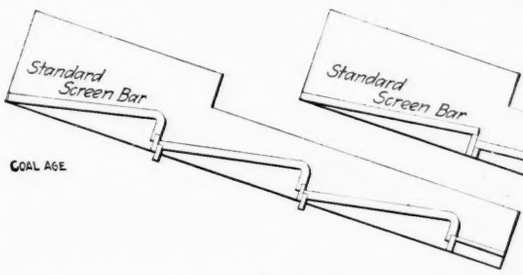


FIG. 3. BAR SCREEN, WITH ENDS OF BARS BENT DOWN

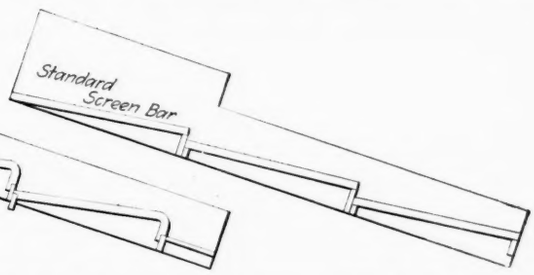


FIG. 4. BAR SCREEN WITH 4-IN. DROP AT END OF EACH SECTION

Coal that breaks flat must necessarily have a different treatment than that which breaks into approximate cubes. A coal that breaks in the latter manner can easily be screened over the usual round perforations, but coal that breaks flat is apt to give a great deal of trouble not only to get a clean product, but to prevent the screens from getting badly clogged.

This difficulty can be overcome by one of several methods, each being adapted to a slightly different coal. First, in place of the round perforations, slotted perforations, or those whose length is greater than their width, can be provided, as shown in Fig. 1.

Second, the plates can be made of the so called lip-screen pattern, as in Fig. 2, where the perforations are very long compared to their width, and become slightly wider at the lower or discharge end. These screens also have a slight drop at the end of each series of slots, which tends to assist in their cleaning.

A third method is to use bar screens made in 4-ft. sections, the end of each section being bent down about 4 in. and set on cross-bars, as shown in Fig. 3, so that any long pieces of coal which would normally tend to hang in the slots will freely drop over the end of the bar and continue down the screen.

WHERE THE SLACK RIDES

Where slack coal tends to ride down on the large lumps, but otherwise cleans freely, the screens can be made in 4-ft. sections with a 4-in. drop at the end of each, as illustrated in Fig. 4. This drop tends to either turn the coal over or else to shake the slack off of the larger pieces.

Where screens are overcrowded and unable to handle the tonnage put upon them, their capacity can often be materially increased by placing a relief or false section about 8 in. above the main screen, making this relief section about 6 ft. long with perforations approximately 2½

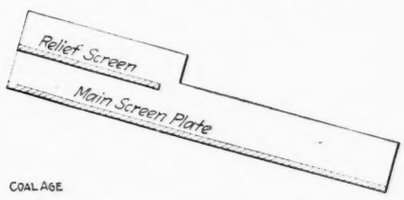


FIG. 5. ARRANGEMENT FOR OVERWORKED SCREEN

times the diameter of those in the screen below, as shown in Fig. 5. This will divide the coal and relieve the lower screen of a certain amount of work.

The trouble in shifting screen plates when changing the size of coal can sometimes be avoided where one of the screen perforations is very large, by making a set of plates which will lie over the main plate, and so perforating the false plate that the smaller perforations will register with the large ones underneath, giving two or three holes in the false

plate for each of the large holes below. These plates can be hinged on the side of the frame and can be let down to cover the under screen just as dead plates are lowered for making run-of-mine. They can be so hung that they will not interfere with the run-of-mine dead plates, which can also be so fastened that they in turn will lie flat on the false screen plates.

In tipples where a number of different sizes of coal must be made, after a capacity of 1500 tons is reached, it is difficult to load direct from shaking screens into the various cars. It is then advisable to install an elevator in connection with a revolving screen, taking the nut and slack from the screen and delivering them into bins, from whence they can be drawn out at infrequent intervals into the coal cars.

Revolving screens have the advantage of large capacity and give very little trouble in operation. Where coal is dry, a good product can be obtained by equipping such screens with perforated plate, but where wet it is very difficult to separate the slack or dust out of the coal. Under such conditions. I have found that the best results are obtained by using wire cloth, but this must not be of the flat-rolled type, but should be of the old-fashioned double-crimped variety. To the screens must be added beaters, preferably good stiff brushes which operate from the outside and throw back any adhering material.

Where brushes and the double-crimped screen cloth are used, a fairly good product can be obtained, even though the coal is quite sticky. In making the very small sizes with revolving screens, however, the mesh should be approximately ⅛ in. larger for wet than when screening the corresponding size of dry coal.

Overwind Prevention in England

Special Correspondence

Apparatus employed in Great Britain to prevent mis-manipulation of hoisting engines. This is the first of a series of articles on this subject and describes an appliance known as the "Visor."

In mining, as in many other industrial processes, it is the personal factor which introduces the greatest element of risk. If this were not so, the elaborate rules, the strict search for matches, and the appointment of inspectors would not be so vitally necessary. Even apart from direct infractions of the rules of common sense and safety, a great many accidents are caused by temporary lapses from attention or errors of judgment on the part of operators.

There is no department in which this is more true than in the operation of hoisting material or men from a shaft or slope. With the high speeds of hoisting now prevalent, a moment's hesitation may mean disaster and death. It is not surprising, therefore, that many devices have been developed for the purpose of exerting a certain amount of control over the engine-man's operations.

So many of these have, indeed, been devised that it is foolish to spend time on those which merely seem to possess potentially good qualities if tried more extensively. Space will only permit of the description of those gears which have actually proved their value by direct application in British practice.

The Visor

One of the most widely known devices for the prevention of overwinding is the "Visor" made on the Bertram patents by the firm of John Wood & Sons, of Wigan. This invention has prevented many overwinds and other accidents which otherwise might have had disastrous results.

The illustration, Fig. 1, shows how the Visor does its work, though it must be understood that the positions are not drawn with absolute accuracy. The governors A which act only as speed indicators are driven by suitable gearing from the crank or drum shaft of the winding engines as is also the worm-wheel shaft *B;* the latter shaft makes approximately one revolution per winding, and carries the beaked cams *C* which are adjusted to the exact required positions.

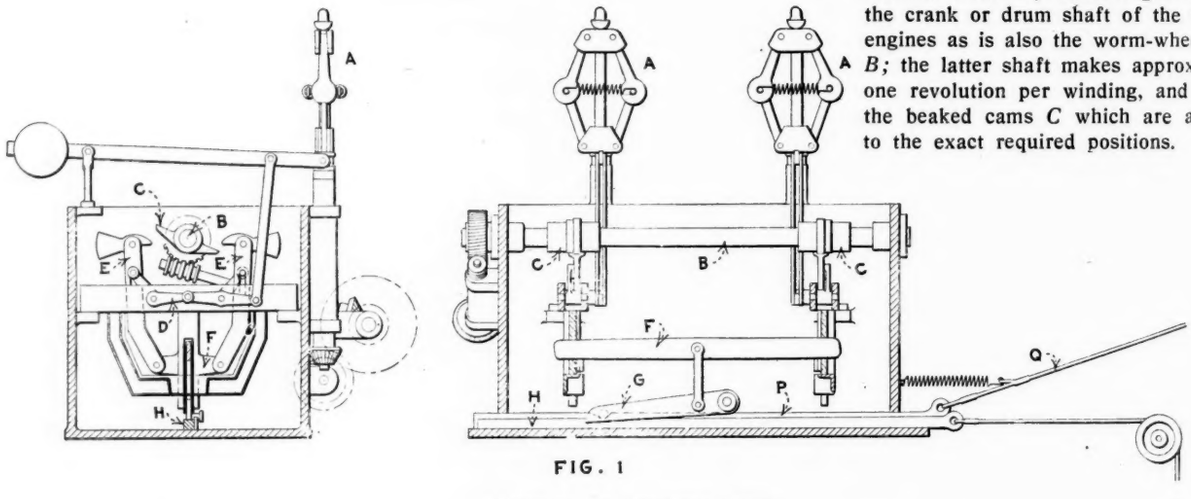


FIG. 1

Visor in Its Simplest Form

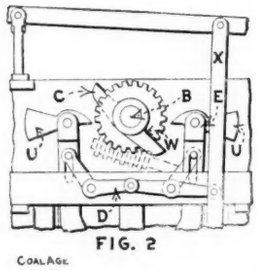
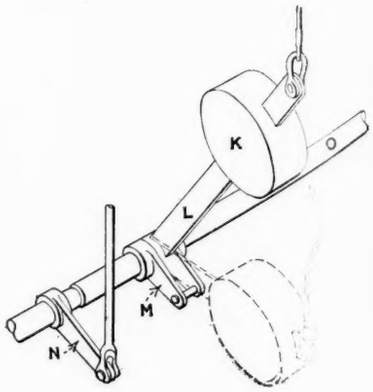


FIG. 2

COAL AGE

Visor with Multi-beaked Cam



As the speed of the engines gets up, first one, and then the other governor flies out quickly and throws (through the medium of the levers *D*) the vertical arms *E* with hooks attached inward, bringing the said hooks in line of contact with the beaked cams *C*. When nearing the end of the wind, if the engines are brought to rest in the usual manner the governors fall and bring back the hooks out of the line of contact.

If, however, through any cause, steam is not shut off at the usual point or the engines are not slowed down, the hooks make contact with the beaked cams *C* and thus lift up the sliding frame and bar *F;* this is connected to the pawl *G* which being lifted out of the notch in the bar *H* releases the same and as it holds the weight *K* in suspension this immediately falls, and simultaneously closes the starting valve and applies the brakes.

The arrangement of levers illustrated for closing the valve or applying the brake is the one most commonly used. Local conditions necessarily entail special designs in some cases.

How the Trip Operates

The one shown acts as follows: *O* is the actuating shaft for the throttle valve or steam brake (as the case may be) and is worked by the engine-man through the lever *N* which is keyed on. On this shaft are also keyed the double levers *M*, with the loose lever *L* between the same. On the lever *L* is the weight *K* which is held in suspension by a cord attached to the draw bar *H* of the Visor.

When the engineman is working this shaft the lever *L* is stationary and the levers *M* work up and down beneath it. When the weight is released by the Visor it falls and forces the lever *L* onto the levers *M*, which, being keyed on, turn the shaft and close the throttle valve, or apply the brake. Of course, two of these arrangements are necessary, one for the starting valve and one for the brakes.

It will be noticed that there is a second draw bar *P* which is connected by the wire cord *Q* to catches in the headframe. These are placed over the cages so that should the engines be started in the wrong direction, the draw bar *P* is drawn out and will, as seen, release draw bar *H* and stop the engines.

On Long Winds

For long winds an arrangement is applied to the worm shaft whereby it is given a longitudinal traversing motion as well as rotation thus allowing the beaked cams to move at a considerably greater speed than heretofore. In a deep pit with the worm shaft making only one revolution and merely rotating the travel of the beaked cam is very slow, and in the event of the apparatus coming into gear it would be apt to allow the engines to run too far owing to the slow release. But with the longitudinal traversing motion the cams can be made to revolve two or three times or more during the period of the wind, thus causing the apparatus to be released very quickly.

Other Forms

The above is the Visor in its simplest form. Various changes and improvements have been introduced to meet special conditions and accomplish special results.

Fig. 2 shows an adaptation for stopping the engine should at any time the hoisting exceed a certain predetermined speed. This is accomplished by means of a multiple cam in connection with the regular beaked cam ordinarily used.

Fig. 3 shows a device to prevent starting the engine in the wrong direction. This is done by means of the auxiliary shaft *G* bearing cams *H*. This shaft is given a traversing motion by means of the screw cut upon it.

Should an overwind occur or the engines be started in the wrong direction, the cams *H* act on the draw bar *P* and stop the engine. It is claimed that this is a very sensitive instrument, 3 in. travel of the cage being sufficient to operate the mechanism.

Fig. 4 shows an arrangement which prevents an increase of speed at the end of a wind. This is accomplished through a tripple or three-beaked cam, the radius of the beaks being so proportioned that the speed of the engine must be constantly decreasing as their points successively pass the latches or hooks.

In addition to the large number of these appliances in daily operation in Great Britain they have also been successfully used in South Africa, South America, Japan and Russia.

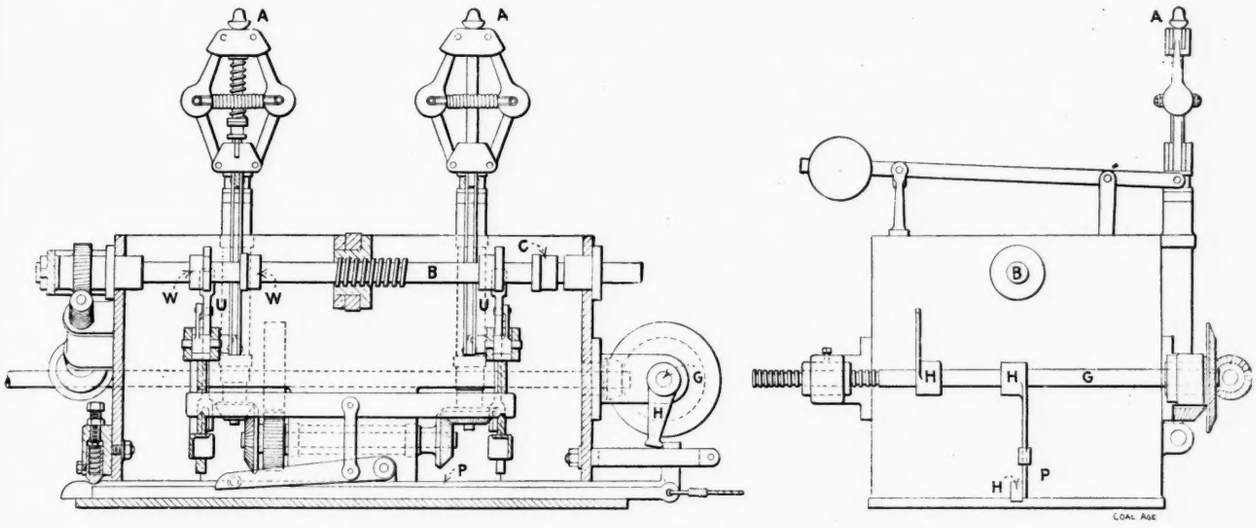


Fig. 3. The "Visor" with Translating Shaft and Auxiliary Cams

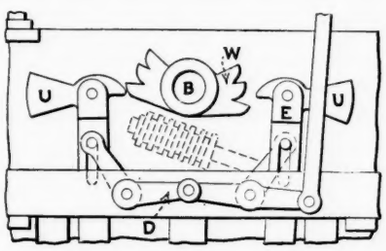


FIG. 4
Visor with Triple-beaked Cam

Cogs are useful where the weight to be supported is so great that ordinary props would be either broken or forced into the roof or floor by the pressure. Where there is insufficient packing material or where a slip or open point extending along a line of coal face begins to weigh before the gob is brought under, cogs are invaluable, as they prevent the breaking down of the working face, the loss of coal and obstruction of the ventilation. For corners of buildings or road junctions, cogs are more satisfactory than a pack wall built of material picked up in the mines.

Sizing and Sorting Coal in England

Special Correspondence

A modern plant which may be considered as a type specimen. Some of the details of construction are given and the path of the coal is traced through the various operations of dumping, screening, picking etc., from the time it arrives at pit bank until it is loaded onto the railroad car.

One of the chief objects at nearly every colliery is to secure the most satisfactory sizing, sorting and cleaning of the coal with a minimum of expense. American readers may be interested in some of the latest methods adopted by British experts which are briefly outlined below.

It is not intended to go into any great variety of different screening plant details and arrangements. A brief description of a recently designed plant which may be taken as a type specimen of what such installations ought to be will be found more interesting.

The plant in question is now in successful operation, in the Durham coal-

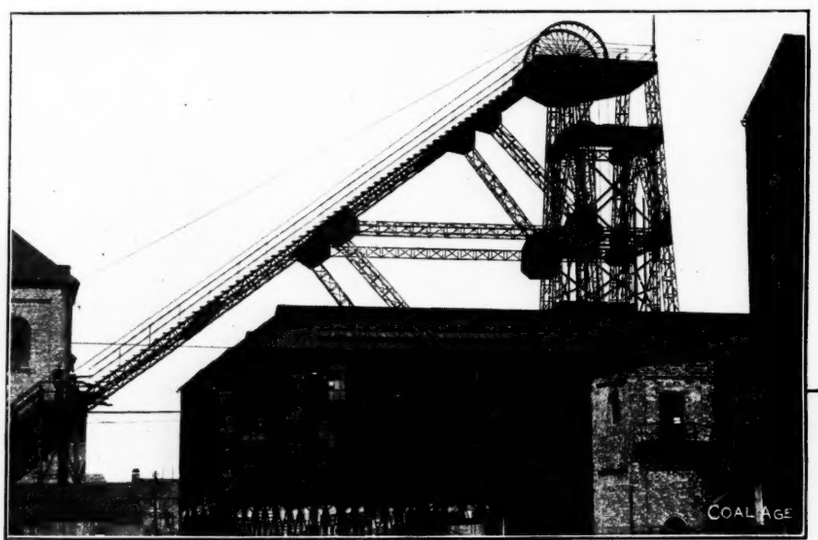


FIG. 1. HEAD FRAME AND PART OF THE SCREENING PLANT

field, in the Northeast colliery district of England. It will eventually have a capacity of 6000 tons of coal per day taken from two seams.

THE BUILDING

The building is L-shaped, 135 ft. 6 in. by 137 ft., the shaft being in the angle formed by the wings of the building. On one side the bays are 11 ft. 6 in. and 10 ft. 8 in. and on the other 13 ft. and 12 ft. each, the height being 34 ft. 4 in. to the eaves.

The building is of structural steel throughout covered with corrugated, galvanized sheet-iron, the height to the ridge pole being 51 ft. 10 in. The floors are built of 3x11-in. planks carried on steel joists.

The belt house floor is level but the upper or tipple floor is arranged with various gradients so that the cars may be handled without tramming. The loaded pit wagons gravitate to the weigh-bridge and tipples, while the empty ones are re-elevated to the shaft bank by means of a creeper.

The cage floors are arranged to tilt to an inclination of one in thirty-six, while a specially designed automatic key lever engaging with the car axles operates the cage latches for the retention or release of the car.

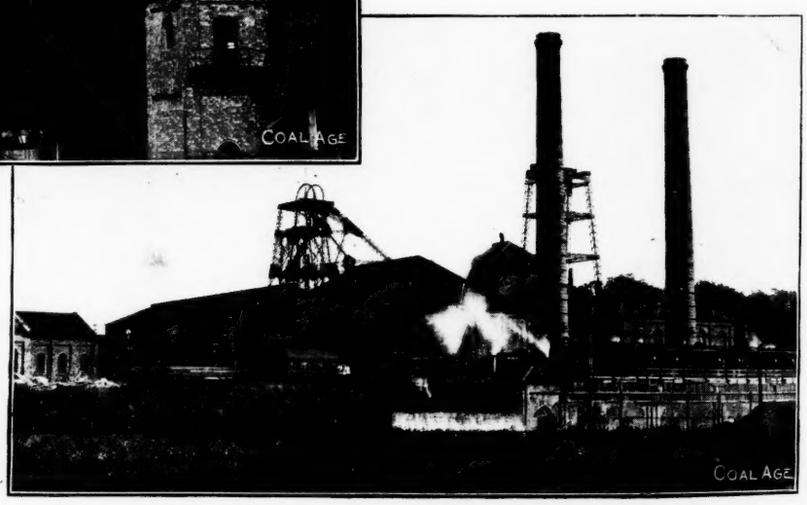


FIG. 2. GENERAL VIEW OF THE PLANT

THE MACHINERY

The tipples or dumps, which are of the rotary type and have a speed of 3 r.p.m., are arranged to work automatically, the incoming car disengaging and ejecting the empty one, which, in turn, starts the dump in motion through the medium of a friction clutch.

Each pit car holds from 1800 to 1900 lb. of coal, which, upon dumping, passes immediately onto a jigging screen. The length of the perforated plate is 16 ft. and the width 7 ft., which gives a total screening area of 112 sq. ft. A flywheel weighing slightly over 1100 lb. is keyed to the eccentric shaft, the rotational speed of which may be varied so as to give a range of 37 to 64 jigs per min. The throw of the eccentric may also be adjusted to range between 3 in. and 6 in.

The 1½ in. coal passing through this screen is jigged upon a bedplate placed below the perforated one, to a chute which delivers it to a canvas conveyor. This belt which is 36 ft. long, 3 ft. wide, extending at right angles to the railway siding and operates at 150 ft. per min. delivers the coal to another canvas belt 124 ft. 6 in. long, 3 ft. wide, which travels parallel to the railway siding and also operates at a speed of 150 ft. per min. At the end of this belt the coal is passed through a revolving screen located outside of the main steel building and all that below ⅞ in. in size is taken to a large washing plant. This washery has a capacity of 1000 tons in 8 hr., and a bunker storage equal to one day's supply.

THE LARGER COAL

Returning now to the coal passing over the screens next to the tipples. This is discharged onto a steel plate conveyor so inclined as to get the necessary head room for delivery onto the second set of screens. This is termed the "inspection belt" since here the coal

can be examined for any dirt, which may be laid aside for the check weighman's inspection.

The secondary screens which are provided with 3½ in. circular perforations are 8 ft. 3 in. long by 6 ft. wide; therefore having an effective area of 49½ sq. ft. The coal dropping through passes onto a steel apron 25 ft. long and 4 ft. wide from which it is delivered to a similar conveyor 55 ft. long for picking and cleaning. The coal over 3½ in. in size known as "best" coal goes through a similar series of operations.

The coal belts for both "best" and "trebles" have at their extremity an ordinary movable swing arm of 15 ft. radius which is raised and lowered by means of worm gearing driven by power and operated by a hand lever through a friction clutch. All of these steel plate conveyors are driven at a speed of 50 ft. per min.

Future Additions

The present installation successfully handles an output of 3000 tons in 8 hrs. The machinery is so arranged, however, that additional equipment may be installed at any time bringing the capacity to double its present amount. All screens, conveyors, tipples, etc., are arranged so that they may be thrown into or out of gear at any time by means of friction clutches.

The entire plant is driven by three-phast alternating current generated by three turbines of 400 kw. capacity each. These turbines also provide power for haulage, coal cutting, pumping and all other power purposes, except hoisting.

In the accompanying illustrations, Fig. 2 shows a general view of the plant, particularly the boiler house and power house, while in Fig. 1 a better detail of the head frame and part of the screening plant may be seen.

Coal "Waste"

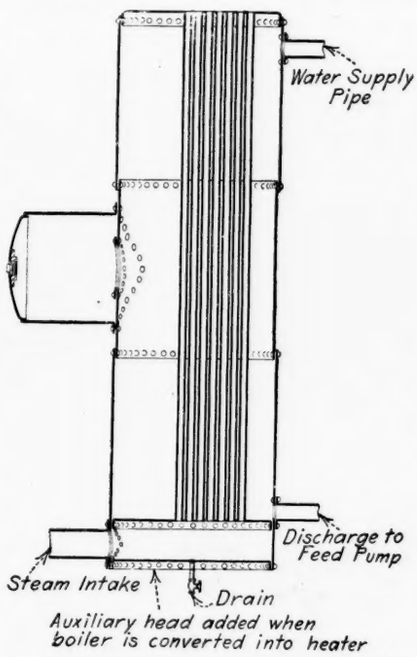
The *Press Bulletin* of the U. S. Geological Survey says, regarding the waste products being recovered from the anthracite culm piles and from other sources:

The production of anthracite in Pennsylvania includes an appreciable quantity of usable fuel recovered from the old culm banks by washeries, and these unsightly monuments to wasteful methods of early times are disappearing from the landscape in the anthracite region. The quantity of coal recovered in the 22 years since the first washery was constructed in 1890 has amounted to about 50,000,000 long tons, considerably more than the total production of anthracite at the beginning of the period. In 1911 the washery product amounted to 4,136,044 long tons. In addition to the coal recovered from the culm banks, 94,647 long tons in 1911, and 91,833 tons in 1910, were recovered from the bottom of the Susquehanna River by dredges.

In the bituminous regions the principal use of washeries is to improve the quality of the slack coal used in the manufacture of coke by reducing the ash and sulphur, although considerable quantities, particularly in Illinois, are washed in the preparation of sized coal for household use. The quantity of bituminous coal washed at the mines in 1911 was 12,543,114 short tons. The washeries yielded 10,999,481 tons of cleaned coal and 1,543,633 tons of refuse.

Home-Made Heater

The proverbial "killing of two birds with one stone" is frequently a somewhat elusive problem around the mines. The conversion of scrap material at small expense into useful and efficient cost-saving appliances may, however, be justly regarded as one of its successful solutions.



Home-made Heater

We illustrate herewith, an improvised feed water heater made from an old boiler. The operation of this device is so self-evident that it needs scarcely any explanation. It will be observed, however, that the exhaust steam flows upward through the boiler flues while the feed water moves downward outside of them. The direction of travel of the two fluids being thus opposed, or in opposite directions, the transfer of heat from the one to the other will be the most efficient.

There seems to be no good reason why almost any type of old fire tube boiler could not be thus used, and as the only pressure to which it can be subjected is that due to the water it contains, one in quite an advanced stage of corrosion should be abundantly strong.

Coal Production in the U. S. During 1911

The following is a summary of the coal production of the United States for 1911 according to the recent report of Edward W. Parker of the U. S. Geological Survey:

	Short tons	Value	Av. num. empl'yes
Alabama	15,021,421	$19,079,949	22,707
Arkansas	2,106,789	3,396,849	5,657
Calif. & Alaska	11,647	23,297	60
Colorado	10,157,383	14,747,764	14,316
Geo. & N. Car.	165,330	246,448	514
Idaho & Nevada	1,821	4,872	13
Illinois	53,679,118	59,519,478	76,600
Indiana	14,201,355	15,326,808	21,182
Iowa	7,331,648	12,663,507	16,599
Kansas	6,254,228	9,645,572	11,625
Kentucky	13,706,839	13,617,217	21,821
Marvland	4,685,795	5,197,066	5,881
Michigan	1,476,074	2,791,461	3,323
Missouri	3,760,607	6,431,066	9,991
Montana	2,976,358	5,342,168	3,866
New Mexico	3,148,158	4,525,925	4,007
North Dakota	502,628	720,489	640
Ohio	30,759,986	31,810,123	46,035
Oklahoma	3,074,242	6,291,494	8,790
Oregon	46,661	108,033	189
Penn. (bitum.)	144,754,163	146,347,858	168,274
Tennessee	6,433,156	7,209,734	10,703
Texas	1,974,533	3,273,288	5,353
Utah	2,513,175	4,248,666	3,060
Virginia	6,864,667	6,254,804	7,392
Washington	3,572,815	8,174,170	6,498
West Virginia	59,831,580	53,670,515	66,730
Wyoming	6,744,864	10,508,863	7,924
Total bitum.	405,757,101	$451,177,484	549,750
Penn. anthracite	90,464,067	175,189,392	172,585
Grand total	496,221,168	$626,366,876	722,335

Japanese Coal in India

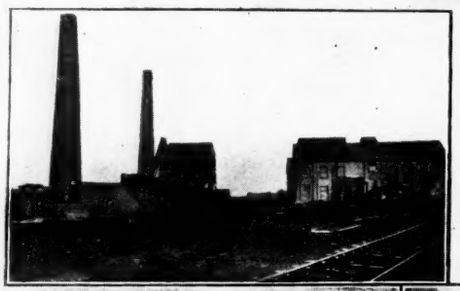
The *Daily Consular and Trade Reports* contains the following notice regarding the India coal trade:

An interesting event affecting the commercial world in southern India, states a Calcutta correspondent, is the conclusion by the Great Indian Peninsula Ry., of a contract for 55,000 tons of Japanese coal to be delivered to the railway between March, 1913, and April, 1914. Hitherto the Great Indian Peninsula Ry. has only imported an occasional shipload of coal from Japan, and this is by far the largest order which they have placed there. It is by no means small in proportion to the total amount of coal used by the Great Indian Peninsula Ry. during a year, and the contract is significant of the possibilities of the future, for it means that the railway can import from Japan screened coal more profitably than Bengal coal. Japanese coal is, of course, coming more and more into general use in India. Japanese coal is reported just as good as, if not better than, the best Bengal coal.

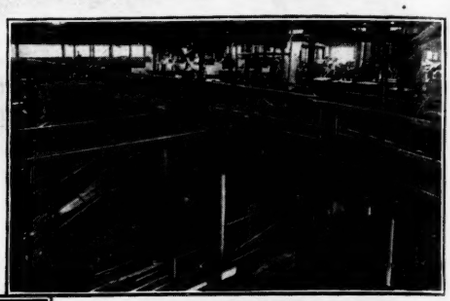
Lignite briquettes are superior to straight lignite for heating purposes in that the process of briquetting has removed a large per cent. of the excessive moisture which exists in all lignites, and thus gives the briquette a higher heat value than the raw material. This should be borne in mind if the fuel is to be transported for any distance. Why pay freight on useless water?

Snap Shots in Coal Mining

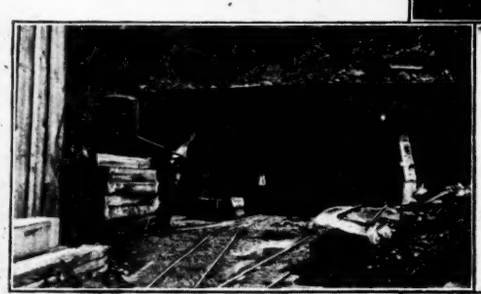
We Will Pay $5 for the Best Photograph Published Here Each Week.



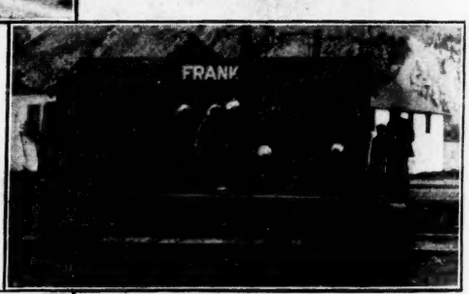
Ovens at Monk Bretton, Barnsley District, Yorkshire, England. Mines Employ 1500 Men.



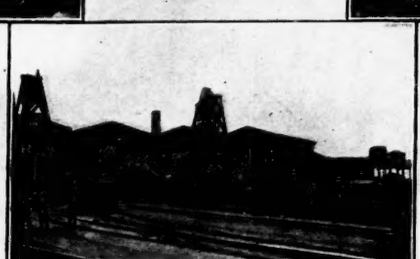
English Coal Screening and Picking Shed. Mechanical Pickers Are Not Much Favored



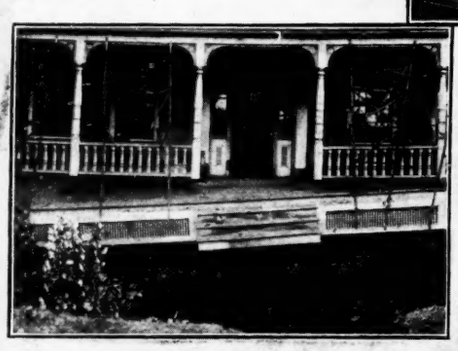
Village and Buildings of the Clinchfield Coal Corporation, at Dante, Virginia.



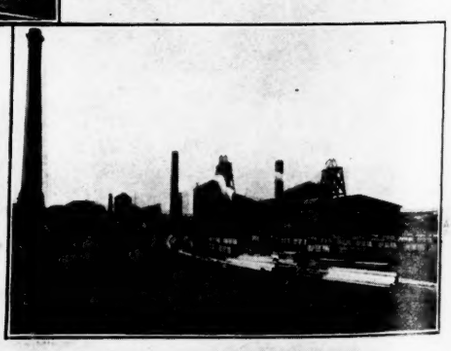
Mines of the Canadian Pacific Ry., Located at Hosmer, Kootenay District, B C.



In Alberta & British Columbia the Hindoo Laborer Is Found Above and Below Ground.



Near View of Barrow Colliery in Barnsley, or Deepworking Section of Yorkshire.



Dwelling at Courtdale, Near Wilkes-Barre, Penn. Undermined by the Kingston Coal Co.

Barrow Colliery, Yorkshire, England, Employing 2800 Men and 400 Ponies, 1200 Feet Deep.

COAL AGE

Some Figures on the Smoke Nuisance

By R. C. Benner*

Some interesting notes on the smoke nuisance in general and with particular reference to Pittsburgh. The losses are not confined to the incomplete combustion of the fuel alone but make an important addition to the cleaning and lighting expenses as well.

*University of Pittsburgh, Pittsburgh, Penn.

Have you ever seen a plant which is being pressed to its utmost capacity, running three shifts of eight hours each, in which the chimneys were not belching forth clouds of the blackest kind of smoke? No. For this is typical of many of our business methods.

The much used slogan, that smoke signifies industry and activity, is fast becoming obsolete, for manufacturers are coming to a realization that it also means waste, and as this is gradually eliminated, the advance in the price of coal will make the saving greater.

History

This nuisance dates back as far as the year 850 A.D. at which time we find, in a receipt for "fossil fuel" given by the Abbey of Peterborough, our present-day bituminous coal. Later in the books of the Bishop of Durham, are listed several letters, which were granted by him for mining "pit coal" in 1180. In 1240 it appeared as one of London's luxuries. As its application became more common it gradually proved itself, likewise, a nuisance and in the reign of Edward the First (1272-1309) its use was forbidden during the sitting of Parliament, the penalty prescribed for allowing smoke to escape from the chimney, being death by hanging.

Since early times the use of soft coal has increased with rapid strides, in fact, much faster than the abatement of the smoke nuisance caused by its combustion. It remained for our own Franklin to invent the first instrument for the prevention of smoke, a stove in which all of the products of combustion were turned to account in heating the rooms. The first patent on a smoke abating device was, however, taken out by Watt, the inventor of the steam engine.

Composition of Smoke

The kind of smoke formed varies considerably with the way in which the coal is burned. Thus it is self-evident that it would be practically impossible to confine conditions of combustion within a range that would produce a soot of uniform composition.

The widest conditions under which it is possible for the combustion to take place in practice are represented by the steam boiler and open fireplace respectively. In the latter the volatile portion of the coal is distilled slowly and at a comparatively low temperature. The soot is low in ash and high in tar and carbon. On the other hand, when the coal is burned under a boiler, we find the ash higher, while the tar and carbon are lower than in the preceding case where the volatile products are distilled more slowly and at a lower temperature. Soot collected at the base of a stack from a boiler furnace contained 15.66%* carbon; 75% ash and 0.09% tar. That collected 70 ft. from the boiler showed 21.8% carbon, 66.04% ash and 0.80% tar, while that from the top of the stack, 110 ft. from the boiler, contained 27.00% carbon, 61.80% ash and 1.66% tar.

Losses Due to Smoke

The losses of efficiency, caused by soot, are small. As an average of 40 experiments on as many different domestic installations Sir Roberts-Austin places the loss as somewhat over 6% of the carbon in the coal used. In the case of boiler operation the amount of soot formed is much less on account of the higher temperature at which combustion takes place, amounting to only from 0.5% to 0.75%. Although the losses from soot alone are small, the decrease in efficiency, due to the escape of CO, H, CH_4, and other combustible gases is much larger, and may be as high as 10%. The estimated annual loss in Great Britain has been placed at 2.5 million tons.

The loss of solid matter in the smoke in the Pittsburgh district will, of course, be much smaller, since gas is burned in most dwellings, where the percentage loss is quite high. Taking the annual coal consumption of this district as 30,660,000 tons, the loss due to carbon escaping into the air will be from 153,300 to 229,800 tons. The amount of soot in the air varies greatly, depending on the weather. Three measurements made by filtering known quantities of air, gave 0.42; 4.40 and 9.00 oz. per million cubic feet in clear, dull and foggy weather respectively. The soot deposited in 24 hr. varies between still wider limits. On two occasions this was found in Schenley Park (Pittsburgh) to be 12,556 lb. and 9789 lb. per square mile. This represents the amount which fell and was carried down by snow during a period of 24 hours.

*Cohen.

What Smoke Costs the People Who Do Not Make It

The cost of living in cities where smoke fills the air, such as St. Louis, Cincinnati, Cleveland and Pittsburgh, is greatly increased by the excess of dirt. Estimates have been made in a number of places of the damage done by smoke and soot. In 1908 London placed the direct and indirect annual loss at $25,000,000. In this country the experts employed by the Cleveland Chamber of Commerce reported in 1909 an annual loss, attributable to smoke, of $12 per capita, or $6,000,000, an amount equal to the total city taxes in 1908. Mathew Nelson, chief smoke inspector of Cleveland, asserted that the loss there was $100 per family, corresponding to $8,000,000 for the entire city, or $3,000,000 more than the annual city taxes. Dr. Holdsworth in his recent report on the smoke nuisance in Pittsburgh placed the loss at $20 per capita or something over $10,000,000 for the entire city. In a paper read before the American Civic Association, Herbert H. Wilson, one of the engineers of the Bureau of Mines, stated that a careful government inquiry into the toll paid by the people of the United States shows a total of over $500,000,000 or a per capita loss of $17 for every man, woman and child in the larger cities.

A few of the facts which have been found by our economists in Pittsburgh, where we are making the most careful and exhaustive study of this kind ever undertaken, will be of interest. The cleaning bill of some of our office buildings is as high as $75,000 a year, so the importance of the subject is obvious. To cite a particular example, it costs a certain building here $320 more a month for window cleaning than if the same were situated in either New York or Philadelphia. The lighting bills in office buildings are increased by at least 40%, due to the smoke in the atmosphere. The amount of sunshine is cut off by about 20%, while the light is diminished by at least 40% in the more smoky sections of the city.

We have found that it costs from 33% to 50% more to conduct a hospital in Pittsburgh than in other cities. For instance, in the matter of an extra cleaning force, one hospital could save $3600 a year, another $1200, if the city were free of smoke.

The damage to goods in wholesale, retail and department stores runs as high

as $30,000 a year in the case of one concern. In some instances, where we have asked what is approximately the cost per year of extra precautions and additional labor, we receive the answer: "The cost is a public cost," and so it is. The ultimate consumer foots the bill.

It is customary for the owners of many of the downtown buildings to wash the entire outside every so often. One store in Pittsburgh is cleaned twice a year, while a branch in another city, which is comparatively free from smoke, is cleaned only once in two years. The difference in cost is in the neighborhood of $2000. The question of painting is also a large additional expense, but one for which we are not, as yet, ready to give figures.

The study of a large number of laundry bills shows that there is an increase in these of at least 50% in Pittsburgh. This means $1.50 per month for young men who board. In the case of young ladies, an actual bill in one instance from September to May 1912 was $47.60, while for a like time in New York City, the same young lady had a bill of a little over $12.

Other Disadvantages

Smoke cuts off the sunlight and increases fogs from 20 to 40%. This adds to the cost of artificial illumination and is detrimental to health. The number of deaths from what are commonly called the bad air diseases, pneumonia, etc. have been found to increase greatly after fogs of any duration.

Soot is injurious to plant as well as animal life. A few plants will not grow at all in places where smoke is prevalent, while many others do not thrive as they should. This is especially true of those which have rough or hairy leaves; this gives the soot a chance to lodge so that it is not so readily washed off by the rain. The soot itself is not so harmful, the tar and acids which it contains being the mischief makers. The corrosion of metals is often accentuated greatly by the presence of soot. There is usually enough tar present to make it adhere firmly to the metallic surface and the acid forms the third element necessary for electrolytic corrosion. This causes many unprotected metals to disintegrate with great rapidity. A piece of aluminum $\frac{1}{32}$-in. thick on a certain down town building, was completely destroyed in less than three years.

The smoke question is, then, one of vital import to every dweller in a smoky city. The aesthetic loss, the danger to health, to say nothing of the economic loss side of the question make the smoke nuisance, with its attendant evils, the greatest problem of a manufacturing town.

Exhaust Steam Has No Effect on Mine Roofs

By Frank Haas*

When it was first seriously suggested that exhaust steam be put into mine air for the purpose of saturating it, one of the numerous objections advanced was that steam would reduce the stability of the roof and thereby make the mine unsafe. It is not known now whether this objection was based on facts, or whether it was simply a surmise for argument or merely a theory.

Whatever its source, the question which it brings up must be disposed of in some way. No matter what might be the advantages of exhaust steam in mines in preventing the propagation of coal-dust explosions, its value as a safety precaution would be wholly lost if it caused a dangerous condition of the mine roof.

We all know that a bad roof causes most of our fatal accidents, and if exhaust steam makes a good roof bad or a bad roof worse, I would say abandon exhaust steam. But a happy solution lies in the probability that it may not be true.

Tests Made in 30 Mines

Several years ago, when the practicability of using exhaust steam as a preventive of dust explosions occurred to me, and the problem was considered on a theoretical basis and appeared promising, extensive experiments were made, some of which are recorded in Bulletin No. 20 of the Bureau of Mines. These experiments, among others, convinced me that exhaust steam was the most effective remedy against the propagation of coal-dust explosions, and the method was at once adopted at about 30 of the 43 mines of our company in the Fairmont region.

So general an adoption of this system might have seemed precipitate, but the company having just recovered from a very disastrous explosion (Monongah), and still having that catastrophe freshly in mind, readily welcomed any remedy which promised success. Fortunately we have had no reason to regret this action, and we have had opportunity to test the use of steam in a thoroughly practical way.

Since the time when it was first used in the mines, we have had two severe explosions of gas, each of which was violent locally, but there was no propagation beyond the gas area. Here were two cases where the conditions for a disastrous dust explosion were favorable, but both mines had been furnished continuously with air saturated by exhaust steam for some time previous to the explosion and the fact that the propagation did not extend over a large area is attributed to this precaution.

*Consulting engineer, Consolidation Coal Co., Fairmont, W. Va.

Unanimous Opinion that Exhaust Steam Does No Harm

The bugaboo of bad roof conditions was not overlooked. Mine foremen, superintendents, inspectors, in fact everyone capable of an opinion was urged to watch the effect on the mine. Of course, this resulted in a miscellaneous collection of variant opinions. There were those who regarded the action on the roof as good, others considered it bad, and some believed the effects were inconsiderable.

As is often the case after the introduction of a new system, opinions predominated against it, but when it had been in continuous use for some time, the adverse views, either tempered by closer observation or longer experience, disappeared and everyone agreed that, as a result of the use of steam, no change in the condition of the roof was discernible. So much for the "practical miner's" opinion.

Proof from Accidents and Costs

Accidents, the dreaded result of mine humidification, and the main question at issue, have shown no increase. We have accurate records to testify to this fact.

Again, in every mine there is an appreciable expense which may be attributed to "the cleaning up of falls," and this cost should show whether any marked difference in roof conditions has occurred. Fortunately our mines have kept this item of expense separate for many years. Comparing this charge for the last four years since exhaust steam has been used, with that of the six previous years, we find no difference other than could be attributed to ordinary fluctuations.

The Logic of the Question

Facts, though meager, and opinions, though questionable, are the best evidence, but let us look at the question from a theoretical side.

Mines of our climate and elevation are naturally damp, and by that I mean that if allowed to stand without ventilating current, they would contain a saturated atmosphere. Should an air current be established in which the quantity of moisture was less than in normal saturated mine air, unnatural conditions would inevitably exist in the mines and these would be apt to affect the strength of the roof.

The temperature of the mine is but slightly changed. Exhaust steam is really a misnomer, it is merely precipitated water in a saturated atmosphere. The temperature is rapidly dissipated and its effect, if any, would be entirely lost within a short distance from the intake.

Summing up, therefore, all evidences available, I must state it, as my unbiased opinion that steam does not have any harmful effect on bad roof.

The Winhey Leakage Detector

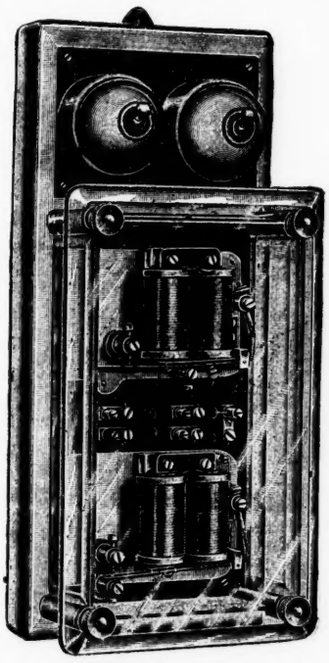
Special Correspondence

Describing apparatus for detecting small leaks in an electric circuit, and for breaking the current instantly before the leak has attained such magnitude as to become dangerous to life or property.

A paper discussing the "Protection of Electrical Installations in Mines by the Use of the Winhey Leakage Detector" was read at the March meeting of the Manchester (England) Geological & Mining Society by Eustace E. Baker, the gist of which was, in part, as follows:

Protection and Detection

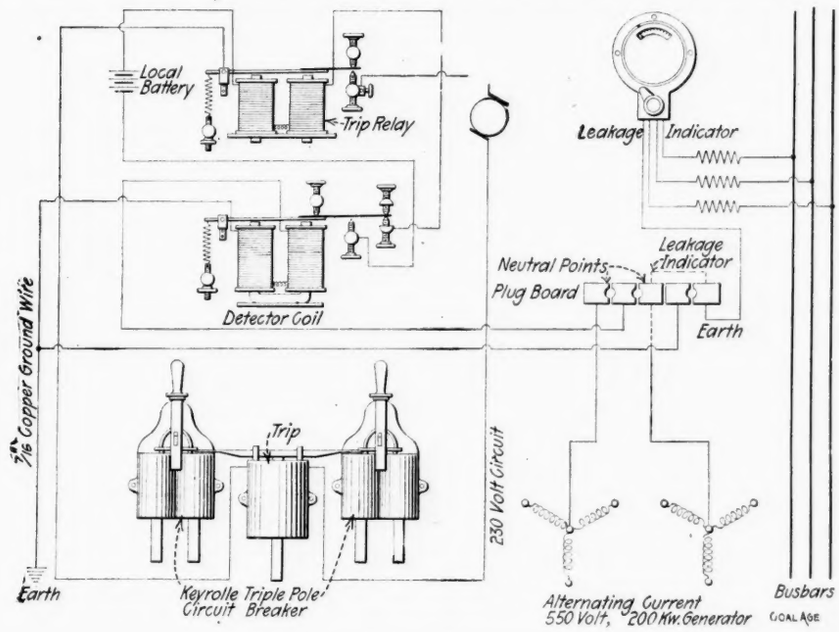
Many instruments have been devised to prevent trivial mishaps, but apparently more with the idea of shielding the plant from danger than providing real protection against accidents to individuals and property through shock or fire. There is a necessity in mining work for an instrument which will operate instantaneously, and so give warning by cutting off the current at the approach of an accident, rather than after the accident has actually occurred.



Mounted Instrument

The Winhey leakage detector has been designed and developed to meet these requirements. It operates with such a degree of sensitiveness as to isolate an installation the instant that a ground takes place, and before a leakage of sufficient magnitude is maintained long enough to cause any danger of accident through shock or fire.

In testing one of the instruments on a 550-volt alternating system, the amount of leakage current necessary to isolate the installation was found to be only sufficient to give a shock which could be appreciably felt in the nerves of the wrist and ankles, just enough to give warning that something had occurred. In the case of accidents through fire, it is quite possible for a leak to be formed with sufficient resistance in its path to earth for actual sparking and burning to be going on, yet not of sufficient magnitude to have any effect on the ordinary cutouts or circuit-breakers. Such sparking is liable to set fire to any inflammable material within reach, or to ignite gas, if present. Tests have indeed proved that the sparking from the make-and-break of an ordinary open-type electric bell with a 2-volt cell suffices for gas ignition.



Showing Board Connections

The necessary experimental work in connection with the development of this apparatus, has been extended over a considerable period, and was accompanied with no little risk; in fact, the inventors remarked that before they were able to bring their device to the present state of perfection they had experienced sufficient shocks to kill a regiment of soldiers. Fortunately, however, only one life was sacrificed, that of a rat.

An account of this experiment is interesting, as it is a further proof of the fine degree of protection which the instrument affords. The rat was caught in a wire trap, and, in order to ascertain whether the detector was capable of protecting its life, the cage was grounded, and the rat was offered a connection from one phase of a 550-volt three-phase 40-cycle system, which it bit, thus making a good connection. The detector opened the circuit, and the rat was apparently none the worse. The detector was then cut out, and the experiment repeated, with the result that the rat was instantly electrocuted.

On large installations supplying a number of pits, it would seem advisable where possible to have the circuits split up by means of transformers, so that each section could be controlled by its own detector, and thus avoid the possibility of a fault interrupting the whole supply.

Not Suited to High Voltage Current

In the discussion that followed the reading of the paper it was pointed out that the provision of safety devices of the character described is clearly to be encouraged, and though it might be expected that this instrument would be too sensitive for everyday working, its record appears to show the contrary. The instrument seems, however, to have but a limited field of usefulness. It probably could not be used on any high-pressure system, nor on any extensive medium-pressure system, nor on any system, in short, in which the normal leakage current is such as would be dangerous to life. Within its limits the success of the new detector appears to be clearly demonstrated.

The Coal Mining Industry of Japan

Foreign Correspondence

As we see in this article, Japan is not so far behind other countries in the coal industry. Her methods are for the most part uptodate. A particularly noteworthy feature is the care which the companies take of their employees.

It is believed that coal was first discovered in Hokkaido less than 60 years ago. Considerable progress has been made recently in this industry, and there are prospects of still further development in the near future. Experience in Great Britain, however, has shown that the making of estimates of the resources of the mineral is an occupation affording but little satisfaction, so great is the liability to error.

In the land of the Mikado it is not unlikely that this experience will be repeated. In 1891 the engineer to the Hokkaido administration estimated that the fields examined contained 600,000,000 tons of coal, an estimate which has since proved to have been singularly low.

Putting the figure down as being equivalent to the estimated resources of the rest of Japan, a total of 1,600,000,000 tons is arrived at for the whole country. Later, of course, the hidden coal fields may add very considerably to the total quantity.

The Production

In 1910 the coal production of Japan was 15,681,324 tons, valued at $50,331,788. The output from Hokkaido was 1,591,699 tons, valued at $6,246,590. In seven years this represents an increase of nearly 50 per cent.; but the value of the coal is not being maintained, because of the introduction of labor-saving devices and improved machinery.

The individual annual production of the Japanese miner is about 158 tons; while his average daily wage-earning capacity is only 35c. We are told, however, that a workman is able to exist on a few cents' worth of rice per day.

The miners in the Hokkaido district receive the best pay, but there is a tendency for the supply of labor to become greater and the wages to fall correspondingly, due to the increase in immigration and development. Throughout the country the working mining population is about 100,000, the number in Hokkaido, in 1910, being 10,024.

The Mines at Hokkaido

On the surface and within the mines of Hokkaido, women are employed as miscellaneous workers, carriers and coal dressers, but in other parts of Japan they are engaged also in the actual coal mining. The contention of the managers is that the best results are obtained in those galleries where the sexes work side by side. Notwithstanding this fact, however, the Consul regards as a possibility that the voluntary absence of women miners in Hokkaido is the forerunner of a general legal prohibition.

The coal-mining industry of Hokkaido is virtually controlled by the Hokkaido Colliery & Steamship Co. This concern was founded as a railway company in 1889 with special privileges from the government to own and operate coal mines. Its original capital was $6,480,500. This was increased to $26,919,000 in 1906.

When the Imperial government nationalized the principal railways of the country in 1906, the company ceased to be a railway company, and expended its energy in enlarging its colliery work, shipping service, coke manufacture and forestry business. It also established an iron foundry and, in conjunction with two other companies in the United Kingdom, opened a field works in Murroran.

The Hokkaido Colliery & Steamship Co. commands nearly all the coal mines and virtually monopolizes the port of Otaru, besides owning a fleet of steamers and conducting the business of shipping and coke manufacture. It produces about two-thirds of the coal mined on the island and indisputably controls the coal business of Hokkaido.

The Yubari No. 1 Mine

The coal of the Yubari No. 1 mine is the best in quality. It exists in the largest quantities and the Imperial Naval Department and many foreign warships in the East make constant use of it. It has a specific gravity of 1.223, and its approximate analysis is as follows:

Moisture, 1.120; volatile matter, 46.588; fixed carbon, 49.585; ash, 2.440; sulphur, 0.267.

The methods employed in the mines are a combinataion of room and pillar, and longwall. Underground haulage is sometimes done by hand; usually, however, horses are employed. In one case, train loads are brought to the surface by compressed-air locomotives; but otherwise, hauling or winding engines are employed. It is interesting to note that hauling and winding by engines having electricity for the motive power is finding considerable favor.

Ventilation

The Yubari No. 1 mine is classified as gaseous, and, for this reason, special attention must be paid to ventilation. Two 20-ft. Guibal fans and ten Champion fans, from 4 ft. to 8 ft., are employed. The larger of these fans are driven by steam, and the smaller usually by induction motors. The Champion ventilators can be used either for exhausting or blowing, by simply changing the revolutions of the shaft. This device is especially useful for changing the direction of the air current in the mine, in case of accidents.

In addition to these fans, there are also provided underground a fair number of small Eisenkeis fans and a 4-ft. Champion ventilator, ready to be driven by compressed air, in case of emergency. Ventilation is regulated by partitions erected at intervals across the roadway. By means of these, the air currents are turned in the direction required, and even the most remote galleries are reached These partitions, furnished with self-closing doors, also divide the mine into ventilating districts, thereby confining the damage in case of explosion. In the smaller mines of the island, however, ventilation is entirely natural.

Five thousand men are employed at the Yubari No. 1 mine, producing annually about 500,000 tons of coal, valued at $1,000,000 to $1,500,000. This is the "show" mine of the island, with the most modern plant and improvements. For greater safety, benzine lamps of a German make are used. The coal dressing is practically all mechanical and the coal is classified by screening. From the lump, the dirt and shales are removed by women, while the small is classified in screen drums and washed in jigs.

Social and Economic Conditions

Hokkaido miners, if they are married, usually live in houses erected at the expense of the colliery owners. These houses are either rented to them or supplied free of charge. Unmarried men live together in furnished houses and are boarded by the company. The cost of their board is deducted from their wages.

At Yubari No. 2 mine the married men's quarters are free, except that a rent is charged of about 10c. per month for a house of 180 sq.ft. for the first three years of occupation. After this, the house is free, the company undertaking all repairs. The unmarried men are charged 8c. a month for food and lodging.

Extras, not exceeding in value the amount of a month's wages, are deducted at the end of the month from the wages due, and the balance is paid to the employees. A committee, elected by the miners from their own number, supervises the sanitary arrangements of the dwellings. The necessary outfit is supplied by the company.

Insurance and Accident Funds

The miners and operators contribute to an insurance and prevention-of-accidents fund. The amount of each miner's subscription worked out to be about $1.20 a year, more than two-thirds of the funds being received from the operators.

The mining companies in Hokkaido do not generally favor the usual method of raising wages by periodical increases. They seek to induce the miners to save money from their wages by instituting a saving fund, voluntary and compulsory. A miner under contract for a fixed period of years comes under the compulsory system; while the others subscribe voluntarily.

In the compulsory department the interest on savings is 20 per cent., but the rate on voluntary investments is from 10 to 15 per cent., according to the period. In smaller collieries, the latter system only prevails, and the interest paid is from 5 to 7 per cent.

The leading companies have also a system of gratuities, distributed annually. In addition, a souvenir is presented every five years up to the end of the fifteenth year. In that year a silver cup is given for long service, and is an inducement to the men to continue in the employ of the company.

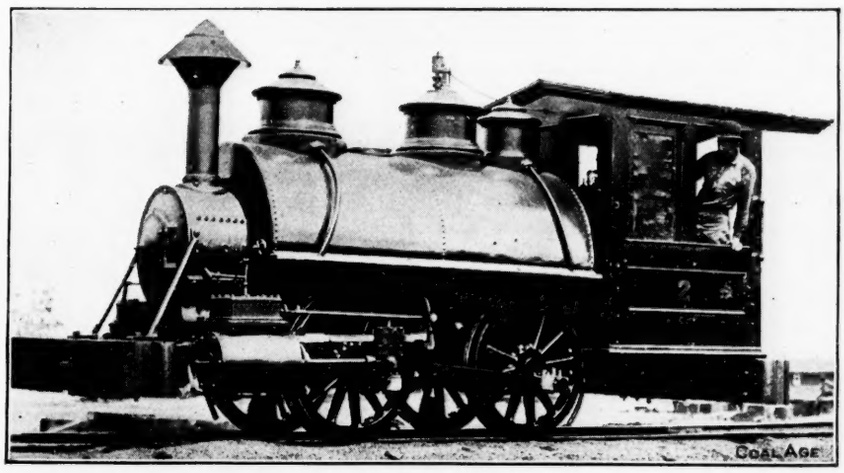
Evolution of Motive Power in Anthracite Mines

The following letter, written by C. A. Dougherty to Irving A. Stearns, about whom we published a little sketch last week, is interesting from a historical standpoint. It throws considerable light on the question as to when and where the first electric and compressed-air locomotives and high-pressure water-tube boilers were employed in mine operations:

Major Irving A. Stearns,
Wilkes-Barre, Penn.

My dear Major:

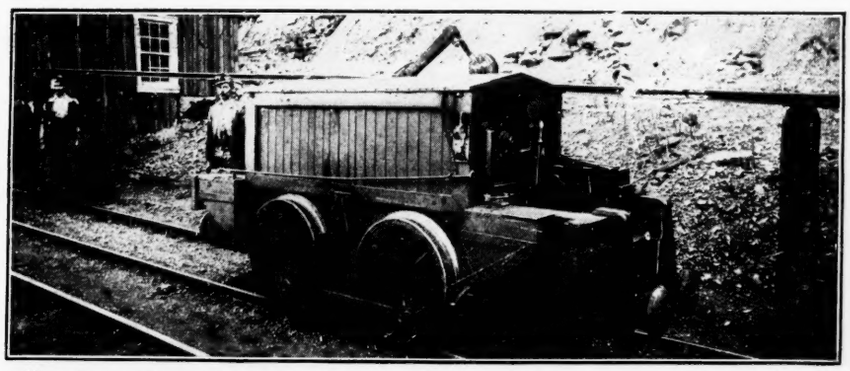
Referring to the matter of the first installation of electricity in the mines in this country, and the installation of the first high-pressure, water-tube boilers and air locomotives in the mines of the anthracite region, all of these installations were made under your direction when you were manager of the Susquehanna Coal Co., Mineral R.R. & Mining Co., Lykens Valley Coal Co. and the Summit Branch R.R. Co. These first installations, therefore, entitle you to the credit of being the pioneer in these particular branches of the mining industry. I take pleasure in submitting to you the following information concerning the same:



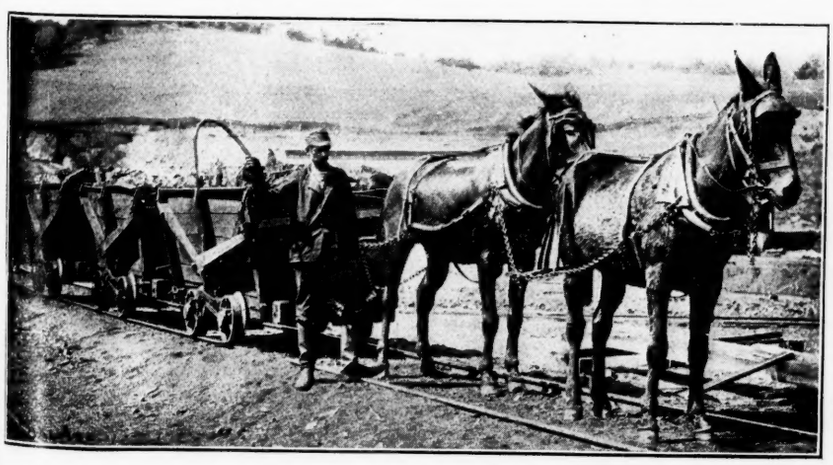
Mine (Steam) Locomotive Introduced in 1870

The first electric locomotive was installed in the old Lykens Valley Tunnel, Lykens, Penn., in 1887. This was purchased under an agreement with the Union Electric Co., of Philadelphia, whose working plant was at Gloucester City on the Delaware. The agreement was dated Apr. 15, 1887, and the motor was built under the direction of William M. Schlesinger, electrician of the Union Electric Co.

The Lykens Valley Coal Co. was to furnish the rails, wire, props, engine, boiler, and all repairs necessary to fully



The First Mine Electric Motor in America. Introduced in the Mines of the Lykens Valley Coal Co., 1887



The Old Original Compound Engine

complete the system, and the Union Electric Co. was to furnish the motor at a cost of $1500, the dynamo at $2000, the motor car for $1000 and installation $200, making a total of $4700. All subject to 90 days' trial.

This was a chain-driven motor. The conductor rail was an iron T-rail spiked to the mine timbers on the side of the gangway, and the current was transmitted through this rail from the power house located near the mouth of the tunnel.

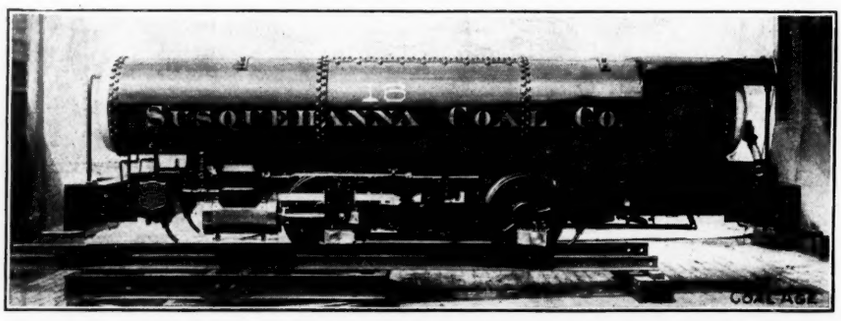
The plant was installed during the summer of 1887 and gave such satisfaction that on Nov. 9, 1887, you placed an additional order with the Union Electric Co. for an electric motor for No. 3 level at the Lykens Valley Coal Co.'s operation, and the frame, as I remember, was an

old mine locomotive with the boiler, etc., removed. This was also driven by sprocket wheels and chain on the side from a Schlesinger motor. The machine, however, lacked weight, and it was loaded at the ends with 3 or 4 tons of cast iron, piled like cordwood, to give it traction.

Later the third locomotive was built at the colliery, with a cast-iron frame, using an old motor. This third locomotive was driven by beveled gear through a vertical shaft. The drawings for this were made by Thomas R. Griffith and R. Van A. Norris. This was the first gear-driven electric mine locomotive ever made. The cast gears originally used gave considerable trouble and were replaced by cut gearing. These electric locomotives are still in use.

High-pressure Water-tube Boilers

The first high-pressure water-tube boilers installed in the anthracite region was upon an order given by you May 16, 1887, to Messrs. Babcock & Wilcox, of Philadelphia, Penn., for one 240-hp. boiler, this boiler to be set in half battery, and was placed at the Luke Fidler colliery of the Mineral R.R. & Mining Co., at Shamokin, Penn. This boiler was the forerunner of all the high-pressure water-tube boilers now installed in the anthracite region.



First air motor in Anthracite Region, Manuactured by H. K. Porter Co., and Introduced in the Mines of Susquehanna Coal Co., in 1895

Air Locomotives

The first compressed-air locomotive installed in this region was built by the H. K. Porter Co., on an order given by you Apr. 3, 1895, and was placed in the bottom lift of No. 6 shaft of the Susquehanna Coal Co., at Glen Lyon, Penn., the price of which was $2700, f.o.b. Pittsburgh, Penn. The cylinders were 7x14 in., driving wheels 24 in. The total weight of the machine was 16,000 lb. on the driving wheels.

The installation of the above mining apparatus has proven most valuable to the mining industry. The development of the electric motor, as well as the high-pressure water-tube boilers and air locomotives, for mining purposes, has progressed materially since this first installation under your direction, and I take pleasure in giving you the above data, feeling that these forward steps taken by you, as manager of the coal companies, is a record that should be historically credited to the one who had the foresight to take advantage of the introduction of such valuable and important mine machinery.

C. B. Dougherty,
Asst. to Manager.
Susquehanna Coal Co., Wilkes-Barre, Penn.

England Forbids Soft Coal Exports

A development of significance both to the world's coal trade and in the uneasy European political situation is contained in London cable advices, which state that the British Admiralty has issued orders prohibiting the export of steam coal from England.

This step to conserve the British coal supply for home warships and steamers would, if long continued, impose a severe handicap on rival navies and merchant fleets, which would have to resort to other fuel markets already fully engaged by demands of a world-wide prosperity. England in the nine months to Oct. 1 last, exported 26,765,000 tons of coal, worth $142,560,000; of this, Germany bought 3,030,000 tons; France 4,055,000; Italy, 4,015,000 tons. Even at that large volume, England has had, as a reflection of last year's coal strike and present domestic business activity, less coal than usual to spare, a condition contributing to the present order. For the same nine months of last year, coal exports were 78% greater, at 47,619,000 tons. The price this year, including all grades, has risen to $5.32 average, against $4.81 last year.

The Admiralty itself has lately taken tenders for the coal required by it during 1913. Though details are not likely to be published, the Admiralty requirements usually amount to about 1,125,000 tons per annum. It is understood that the present offers represent an advance of about 18c. per ton on the contracts for this year.

This situation would normally offer export opportunities for American coal producers, were it not that every ton of domestic output is now in imperative demand. Our exports of soft coal, which for nine months of 1912 were 25,009,000 tons, were confined almost entirely to this continent, Canada taking 18,450,000 tons. If the foreigners come here for bunker coal, they can get little and will have to pay dearly.

The probable effect on this market will be the sentimental one of further stiffening prices here. Soft coal at Newport News and Norfolk, normally about $2.70 a ton, is now quoted at a minimum of $3.50, with even higher premiums offered for what little free coal is to be had. It is harvest time for such coal companies as are not tied down to earlier contracts made at materially lower prices. (Boston News Bureau).

A New German Cable Clamp

In ordinary fastenings of cables to cages there is an eccentricity which tends to strain the rope, and they are difficult to manipulate. To meet these objections more than one new device has materialized in Germany. The Deutschen Maschinenbau-A. G., of Duisburg, has brought out a fixture by which the rope is gripped for a long distance and is easy to insert. The firm F. A. Münzer, of Obergruna, near Siebenlehn, Saxony, also has placed on the market a "wedge rope clamp." The latter device is here to be described.

How the Clamp is Fastened

This clamp is fastened to the cage by chains with studded links, the flexibility of this connection tending to diminish the effect of jars on the cage by rope vibrations and to prevent a thrusting of the cable, also to obviate dangerous bends in it. The two lifting chains fastened to the plates at the sides of the rope clamp are so connected with the cage that each chain must sustain an equal load.

The rope clamp consists in detail of a wedge-shaped, two-part, cast-steel socket *A*, Figs. 1 and 2, in which is cast a white-metal lining. The two halves of the socket with their linings must, however, be so proportioned that they do not meet around the rope. A correspondingly wedge-shaped, two-part, cast-steel housing *B* inclosing the socket is fastened together by strong bolts *C*. The housing is divided at right-angles to the division of the socket and contains inside lubricating grooves which, before assembling the clamp, are to be filled with consistent grease.

The upper end of the socket A is surrounded by a bronze collar *D* which is

Note—Translated from an article by Dr. O. Pütz, engineer, in "Glueckauf," of Essen, Germany, Sept. 21, 1912.

threaded outside. By screwing down an octagon cast-steel nut *E*, the socket *A*, before the tight clamping action, is elevated and brought snug upon the cable. This also prevents loosening of the housing during service. In operation, care should be taken that the hinge bolts *I* and *J* are turned down, and that the under side of the nut *E* is pressed tight on the end of the wedge housing.

The Protection Against Slippage

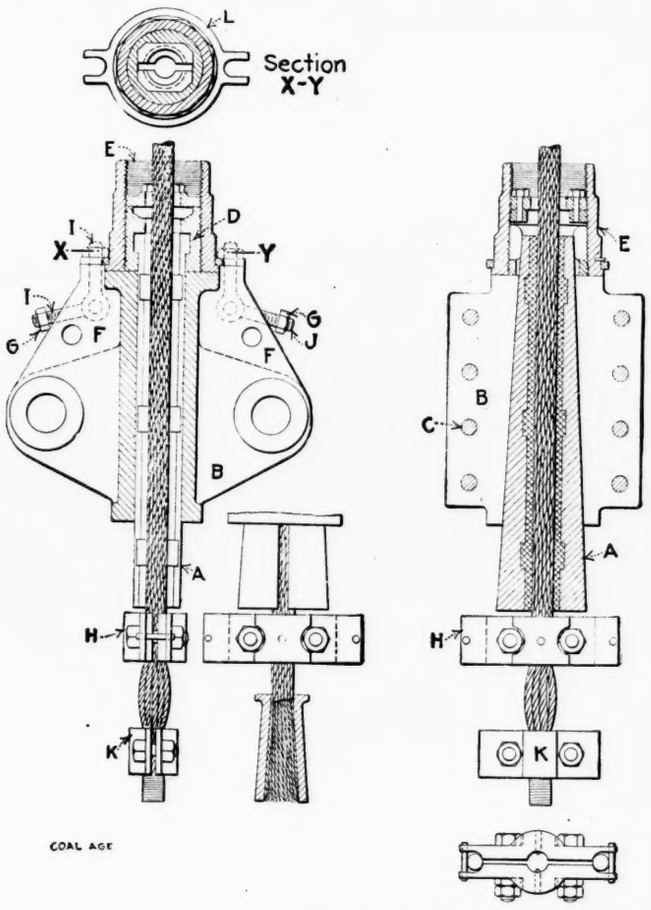
The guard clamp *H*, close below the rope socket serves as a protection against slippage of the cable through the clamp and also as a point of support when introducing screw clamps between the guard clamp *H* and the side plates of the housing in order to adjust the rope by pulling it backward through the loosened clamp.

To shorten the rope in this way, the hoisting cage is rested on a suitable support and the whole clamp is hung with chains or rods attached to the housing at shoulders *F*, which are cast on it for this purpose. The hinged bolts *I* and *J* being turned upright, their nuts *G* are screwed down on the forked projections of the collar *L*, by which they hold the nut *E* against rising.

If now the nut *E* is turned in the direction opposite to that for elevating the cable socket, the latter sinks in its housing and loosens the rope. After shortening the cable, the clamp may be again made ready for use by turning down the hinged bolts *I* and *J* and twisting the nut *E* in the reverse direction, whereby the socket with its white-metal lining is pressed tight against the rope. The greater the weight hanging on the cable, the tighter is the joint.

For further security, there must be driven into the cable under the guard clamp *H*, a thick round taper pin to expand the rope at this point beyond the diameter of the socket bore when fully open, so that the rope cannot pass through it. The pin is prevented from falling out by a second guard clamp *K*, a wire binding or a conical bushing cast with white metal.

When the white metal-linings of the socket are worn out, they may be recast according to instructions which are furnished.



Details of German Cable Clamp

Tests of This Device

Experiments with this clamp, conducted at the Royal Material Testing Laboratory in Gross-Lichterfelde in August, 1911, gave the following results which were calculated for a load in metric tons, and which show the percentage extension of rope.

RESULTS OF TESTS ON NEW STYLE CLAMP

Load in Metric tons	Displacement of wedges with respect to housing, in inches	Displacement of rope with respect to wedges in inches	Extension of rope for a measured length of 40 inches, in per cent.
5	0.16	0.004	0.2
10	0.40	0.004	0.2
15	0.68	0.008	0.3
20	0.92	0.008	0.4
25	1.12	0.008	0.5
30	1.28	0.012	0.5
35	1.56	0.020	0.6
40	1.64	0.024	0.6
45	1.64	0.024	0.7
50	1.92	0.028	0.7
55	2.16	0.032	0.8
60	2.24	0.036	0.9
65	2.36	0.036	1.0
70	2.48	0.040	1.1
75	2.64	0.044	1.2
80	2.76	0.056	1.3
85	2.88	0.072	1.4
90	3.12	0.080	1.6
95	3.20	0.100	1.7
100*	3.52	0.128	2.0

*The Maximum load of 100 tons, acted for 14 minutes during which time wedges repeatedly moved and the weight sank.

Of these wedge cable clamps there are already more than 150 in use at about 50 different mines.

Two Million and a Quarter for Premium Coal

The *Wall Street Journal* has compiled the following estimate of the premiums realized for anthracite due to the prevailing shortage:

Premium coal comes from the individual operators' production, the large companies adhering to circular prices. The individual production is about 20% of the total. Practically the entire individual output is subject to the 65-35% contracts, and under these contracts would, of course, be sold to the larger operators at the breakers and resold by the latter at the markets. Therefore, if the 65-35% contracts were strictly adhered to, there would be no premium coal, to all intents and purposes. But when extraordinary opportunities present themselves, it is well known that these contracts are not adhered to. On some former occasions the contracts were deliberately and openly abrogated.

The trade estimates variously that the independents have been able to dispose of from something less than a tenth to more than a fifth of their entire production in this way, or say, from 1½% to 4% of the entire anthracite production.

On the basis of 25,000,000 tons produced in the last four months, as referred to above, the 1½% estimate would mean that 375,000 tons had been sold at a premium, while the 4% estimate would mean 1,000,000 tons. The premiums have ranged from 25c. to $1.50 per ton, averaging probably somewhere around 90c.

On the lower estimate of quantity, this would show aggregate premiums of $337,500, and on the higher estimate $900,000. Assuming that the independents had been able to dispose of half of their production at premiums, which is within the range of possibility, although greater than the trade believes, the amount of coal involved would be 2,500,000 tons, and the premiums would total $2,250,000.

Current Coal Literature

The Best Thought Culled from Contemporary Technical Journals, Domestic and Foreign

A Terrific Air Blast

The report of G. F. Adams, chief inspector of mines in India, contains the following account of an air blast at the Dhundabad coal mine, of the Manbhum Coal Co:

"A violent blast, produced by an extensive fall of roof, dislodged a rail 11 ft. 6 in. long and weighing 52 lb., hurling it a distance of 32 ft. In its flight it struck a woman on her head and killed her outright. She was engaged in filling a car at the time when the roof fell.

"The accident serves to bring into prominence the serious consequences to life and to the value of a mine which almost inevitably follow the leaving on "first working" of such small pillars that their ultimate crushing strength is but slightly greater than the pressure exerted by the weight of the superincumbent strata.

"In a part of the mine where the cover varied from 100 to 150 ft. and was composed of alternating shales and sandstones, the seam had been cut up into pillars some years ago. At the time of the accident these pillars ranged in size from 100 ft. square to 30 ft. square by 18 ft. high.

"Pillar drawing had recently been started and 19 pillars had been extracted in the usual manner, when weighting of the roof began to assert itself in a mild form. The mine workers in that section were withdrawn and every precaution taken to protect those in other parts of the mine from being exposed to the effects of a sudden and dangerous development of this condition.

"After the lapse of a fortnight a change took place and imminent collapse seemed certain. All the workers were removed from that side of the mine and told to work on the other side of No. 1 pit, 700 ft. away. This order was obeyed. That night the roof over the extracted area collapsed and so strained the adjoining roof that the pillars under it, numbering 103, were unable to withstand the added pressure and gave way, causing the roof to subside over an area of about 160,000 sq.ft. (four acres) and affecting the surface over a similar area, which resulted in damage being done to 57 huts.

"Many persons in the mine were blown over and all the lamps were extinguished with the exception of one, by the aid of which the people found their way to the surface. Two men, sitting under the protection sheets of the shaft bottom, had a narrow escape.

"Extensive pillar robbing had been practiced in the past and had so reduced some of the pillars that it was not safe to take them out. The fact that they had been much reduced in size assisted in the general collapse.

"Large areas have been mined out in other parts of this mine. The subsequent falls have been confined to these areas and have not extended over the standing pillars. This, no doubt, led the manager to assume that the weight would be similarly restricted in this case also. The event, however, is one more proof that when pillars of small size are being drawn, sudden subsidence over an area exceeding the area extracted should be anticipated, and in such cases, all persons should be ordered out of the mine when the roof begins to show signs of collapse."

Ignition of Gas by Electric Spark

By W. M. Thornton*

The igniting powers of an electric spark are dependent not only on the current and voltage which gave it birth but on the length of time during which the discharge continues to take place. This is extended by inductance but not by increased voltage after a certain limit is reached. Another factor which determines ignition is the percentage of gas present.

*Continued from issue of Nov. 16, p. 685.

The known influence of inductance in prolonging break sparks led to an attempt to measure the duration of the sparks made on breaking noninductive currents, and the results were as shown in Table I.

The curves of Fig. 1, which give the times of spark duration at currents very near those causing ignition, show that there is little or no similarity between them and the curves of change of igniting current with voltage given in Fig. 3 of the preceding article in the issue of Nov. 16.

From experiments which will be noted later, it will be shown, however, that there is a critical duration of spark. In the above cases the current is falling rapidly as the arc is drawn out, and provided that the energy of the spark exceeds a certain limit, its duration would not in the direct-current case appear to be of the same importance as that of voltage. In the case of all the rods the time of duration of the spark below 20 volts falls rapidly. It reaches a maximum in each case at a voltage where the igniting current is relatively great, falls as the current decreases, despite the rising voltage, and begins to increase as this approaches the higher limit of direct pressure. The arcs from nickel poles are at low voltages clearly shorter than from iron or copper, but it will be shown later that when the current is alternating, nickel arcs ignite methane on the whole more readily than the others.

In view of the known quenching influence of gas, a few observations were made in mixtures of methane and air of various strengths, and these are noted in Table II.

TABLE I.—TIME OF DURATION, IN SECONDS, OF DIRECT-CURRENT BREAK SPARKS IN A 9.36 PER CENT. MIXTURE OF METHANE AND AIR; CIRCUITS NON-INDUCTIVE

Voltage	50			100			240			480		
Terminal	Copper	Iron	Nickel	Copper	Iron	Nickel	Copper	Iron	Nickel	Copper	Iron	Nickel
Amperes	4.0	4.5	4.5	0.9	1.02	1.1	0.175	0.4	0.55	0.05	0.15	0.16
Duration, in sec.	0.016	0.014	0.0125	0.0073	0.02	0.0128	0.0025	0.0045	0.0065	0.0079	0.0036	0.0135

TABLE II.—TIME OF DURATION OF DIRECT-CURRENT BREAKSPARKS. CIRCUITS, NON-INDUCTIVE; VOLTAGE, 50 THROUGHOUT.

Percentage of methane	6	8	12	14
Least current for ignition, in amperes	3.8	3.7	5.75	12.0
Duration, in seconds	0.03	0.015	0.022	0.032

These experiments are shown in Fig. 2, and it is now seen that when the voltage is maintained at a constant pressure the rate of variation of the duration of the spark, with change of percentage of methane, is similar to that of the igniting current. This result is interesting, as showing that the duration of the spark is proportional to the current passing, and not to the energy of the spark.

Influence of Percentage of Gas in Igniting Current

The least current which will ignite gas in a circuit at a constant voltage must vary considerably with the richness of the gaseous mixture. To examine this more fully, experiments were first made on coal gas, with the results shown in Table III.

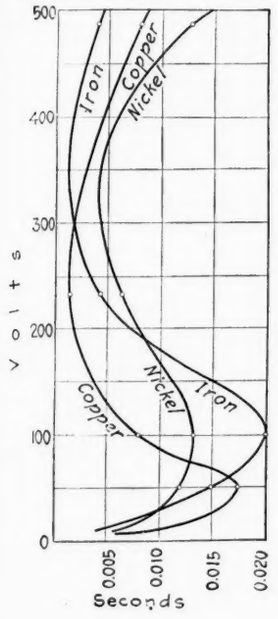


Fig. 1. Duration of Direct-Current Sparks in 9.36. Per cent. Mixture of Methane and Air. Non-inductive Circuits

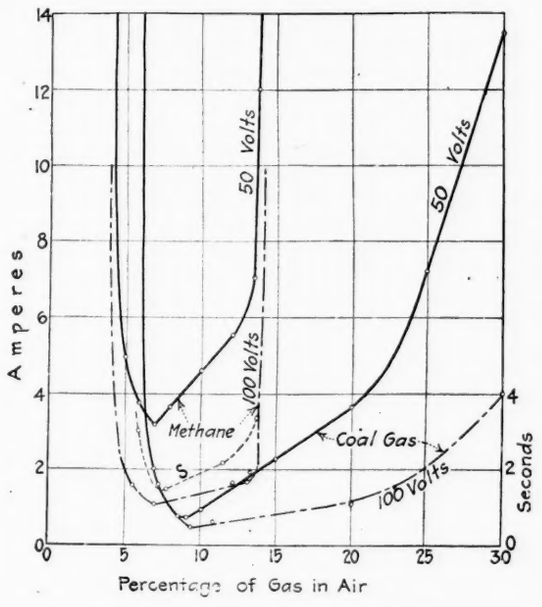


Fig. 2. Influence of Methane and Coal Gas in Air in Modifying Least Igniting Currents. Curve *S* Gives Duration of Sparks in Methane at a Potential of 50 Volts

TABLE III.—VARIATION OF LEAST IGNITING CURRENT WITH PERCENTAGE OF COAL GAS IN AIR. ATMOSPHERIC PRESSURE AND TEMPERATURE; VOLTAGE, 50 THROUGHOUT; SMALL IRON TERMINALS

Gas percentaage	6	7	8	9	10	11	13	15	18	20	25	30
Amperes	3.8	2.0	1.48	1.4	1.48	1.7	2.0	2.37	3.0	3.5	7.0	13.0

Below 6 per cent., no ignitions could be obtained, and this is the limit found by most observers with the usual sparking-coil ignition. The upper limit is generally assigned at 30 per cent., but it is clear from Fig. 2 that ignition can occur beyond it, provided that the source is violent. The flash at 13 amperes 50 volts is brilliant, the activity of the circuit approaching 1 horsepower.

With methane, the results were as follows (Table IV):

TABLE IV.—VARIATION OF IGNITING CURRENT WITH PERCENTAGE OF METHANE IN AIR. VOLTAGE, 50; SMALL IRON TERMINALS

Percentage	5	6	7	8	10	12	13.5	14
Amperes	5	3.8	3.2	3.7	4.6	5.75	7.0	12

No ignitions could be obtained at 4 or above 14 per cent., the limits generally given being 5 and 13. From the curves of Fig. 2, the limiting values under the present conditions would appear to be 4.25 and 14.25.

The limiting percentages of mixture may, and probably do, depend on the method of ignition, and upon the presence of small quantities of more highly combustible gases. In the present case analysis did not reveal any of these in quantities to be readily detected in the gas upon which the percentage experiments were made. The analysis of the gas as prepared from sodium acetate and soda lime was as follows:

Components	Per Cent
Carbon dioxide	0.2
Air	3.5
Methane	96.3

Hydrogen or acetone, if present, was less than 0.2 per cent.

The shape of the methane curve is similar to that for coal gas. There is first a sharp drop curved to a point, from which there is a linear rise to a less well-defined bend, above which the mixture rapidly becomes inert.

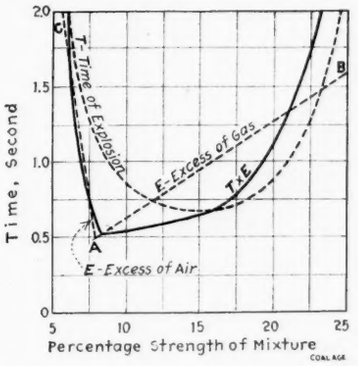


Fig. 3. Suggested Synthesis of the Curves in Fig. 2

The suggested explanation of this is as follows: The two controlling factors appear to be (1) the "time of explosion," and (2) the reduction of sensitiveness to ignition by excess of either constituent of the mixture.

In Fig. 3, *A* is the most inflammable mixture. On either side of this the lines *AB* and *AC* give for any percentage the amount of dilution—to the left with air, to the right with the active gas, the upper limits being perfectly inert mixtures.

The time of explosion *T* of a combustible gas is found in all the recorded cases to reach a minimum value, and to rise again as the strength of the mixture is increased. For petrol vapor the curve is a parabola symmetrical on either side of the minimum value; the time of explosion then increases as the square of the percentage excess of either air or vapor.

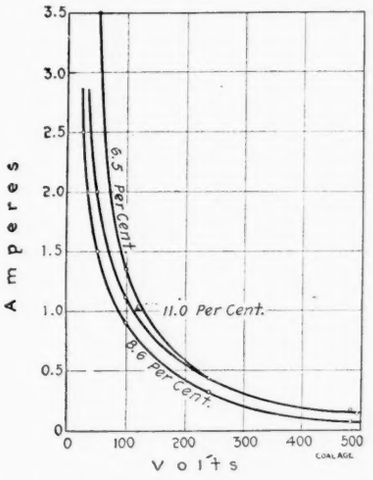


Fig. 4. Influence of Strength of Mixture on Least Igniting Current at Different Voltages in Coal Gas

With coal gas the curves of variation of T with richness of mixture are not so well defined. At the upper and lower limit T approaches 0.4 sec.; the minimum—which is very nearly the same in all the recorded cases—is 0.05 sec. at atmospheric initial pressure, and occurs at 14.5 to 16 per cent.

On either side of this T increases with excess of gas or air, but the branches are not usually symmetrical. No figures are available for methane, but the reciprocal of the velocity of explosion gives a curve similar in character, with a minimum of 13 per cent. In every case of a combustible gas mixed with air, the time of explosion reaches a minimum in a mixture several per cent. richer than that required for a perfect combustion.

The curve of T lies between the upper and lower percentages limiting ignition, and is shown in Fig. 3 symmetrical within them. The product of the excess of gas or air and the time of explosion is a curve agreeing closely in shape with that of the observed least igniting current.

It would appear from this that these are the chief, if not the only, factors which determine the direct current or power required for ignition when the voltage and poles remain the same.

That this relation remains much the same when the duration of the arc is increased by the use of higher voltage is shown by the similarity seen in Fig. 2 between the 50- and 100-volt curves, although an examination of the influence of voltage with different strengths of mixture previously discussed, indicates that it is only below about 150 volts that much difference in the igniting currents is to be expected. At this point, also, the difference in the duration of the arcs begins to increase. With coal gas at both 50 and 100 volts the igniting currents at 11 per cent., in Fig. 2, are slightly above the straight line drawn.

The Taffanel Barrier under Trial

The *Colliery Guardian* thus discusses editorially the Taffanel barriers, which are piles of stone dust resting on shelves, usually placed above a traveling way.

"The disastrous explosion which occurred at La Clarence colliery, Lens, France, on Sept. 3 has created much interest and not a little uneasiness among French mining engineers, inasmuch as some of the *arrets-barrages* (arresting barriers) placed in the roadways for the isolation of the districts failed to arrest the propagation of the explosion.

"The French collieries have not been slow to put to practical test the measures that have been advocated by M. Taffanel and his collaborators at Liévin. At La Clarence, barriers of ashes had been placed in the roadways at certain points, and, after the explosion, it was found that some of these had been undamaged, while others bore slight traces of calorific action, but in either case they failed in their purpose.

"It is a common human failing to ask too much of the remedies which experience has devised for the mitigation of the evils which beset mankind. It probably never will be recognized that rescue appliances, so called 'safety' explosives, coal-dust remedies, *ad lib.*, have their limitations, just as there is probably no absolute 'cure' for pulmonary tuberculosis, and when a remedy fails because the conditions are wholly unfavorable for its application, it generally is discredited to an extent which is altogether unfair to the inventor.

Taffanel Urges That Barriers Are Not Perfect Safeguards

"M. Taffanel has, therefore, been wise in calling together a number of representative mining engineers, to impress upon them the fact that his recommendations have always been accompanied by strict reservations. At this gathering he pointed out that the barrier had only been advocated as a measure presenting much promise of success, which might quite readily be defeated by the existence of abnormal conditions.

"He pointed out that in the report on the fourth series of experiments at Liévin, he clearly stated that in the event of a slow explosion or at a great distance from its point of origin such arrangements might prove to have less value than in his experiments.

"He added the further point, one of much interest, that recent tests had shown that, while the minimum quantities of material recommended in the reports for use in the barriers were about 11.8 cu.ft. of ashes or 26.4 gal. of water per sq.yd. of gallery cross-section, the propagating tendency of explosions was greater in timbered roadways, with irregular wall surfaces, than in a smooth gallery.

"He now suggests that reliance should be placed not on the barriers alone, but that these should be placed in the middle of treated zones.

"There is another point of first importance—namely, that the La Clarence explosion may have been in part due to firedamp, and that the gas of the mine may have assisted in its propagation. In these days we are in some danger of forgetting that there is such a thing as an explosion due wholly to firedamp and that many of the coal-dust specifics have a diminished value in such a case.

The Cause of the Failure Not Yet Apparent

"Pending the inquest on those killed at La Clarence, M. Taffanel refrained from further suggestions as to what actually did take place at the colliery—whether the barriers were properly situated both in regard to their height from the floor and the roadway itself, or whether the requisite quantity of inert matter was used.

"He can only earn our respect, however, when, instead of casting blame in advance upon others, he suggests that the real lesson of the disaster is that research should be prosecuted with a view to establishing the effect of abnormal conditions encountered in the mine upon the results obtained under normal conditions in the testing gallery.

He frankly admits that the final verification of these results can only be obtained underground. A disused mine has now been secured at Commentry, the French authorities having thus followed the lead of Austria and the United States, leaving Great Britain, shall we say, in the lurch.

"Nevertheless, the simple transition from the surface to the subsoil does not in itself remove all the difficulties of research. As we remarked over 18 months ago:—'Experience of actual explosions teaches that such complex phenomena do, in fact, arise owing to the influence of obstructions in the path of the explosion wave. For this reason every mine will probably possess its special characteristics, and will form a study in itself as soon as we know more of the phenomena belonging to the simplest form of explosion wave.'"

Peru as a Coal Producer

Luis A. Delgado, in *Peru To-day*, thus describes the Oyon coal fields: The carboniferous region has a length of 136 and a width of 31 to 37 miles. It reaches from the town of Chancay to Cajatambo and Dos de Mayo.

As to quality, Mr. Watrous, an engineer of the Carnegie firm, says in his report:*

'This coal is semi-bituminous, low in ash and in humidity, and contains a desirable proportion of volatile matter. It is an excellent steam coal, especially for restricted grates, as in steamships, etc. This class of fuel should be in greater demand, for many reasons, among which are quick ignition, rapid development of heat, absence of soot and steady flame.'

In addition to this oily bituminous coal, which is found to the northeast and southeast of Oyón, there are also semi-bituminous, and anthracitic coals, lignite and graphite in well-defined zones. Pure coal is found but a few feet below the surface, and it is this coal which is now utilized.

Reaching Oyón on ascending from the coast, the five principal *quebradas* (ravines) of the river Huaura are encount-

*Informaciones y Memorias, Society of Engineers, Lima, 1911.

ered. In these it is possible to study the exceptionally thick beds of coal, clearly defined between walls of sandstone and slate through which the river has cut its way.

ENTRIES ARE FOR LESS THAN 10 ACRES

At the present time only 280 pertenencias, of 9.88 acres each, have been entered. The only zones in which mines are in operation are Conocpata and Saquicocha, which are the nearest to the smelter of Huaraucaca in the province of Cerro de Pasco. They supply coke to those works.

This coke is excellent, in spite of its being produced in the crudest manner imaginable, by burning heaps of coal in the open air, with a loss in the process of more than 60 per cent of the coal.

The purchasers, benefiting by the limited demand and excess of supply, pay a ridiculously small sum for their coke, the shipment of which is limited by the lack of pasturage for the llamas, which are used in the traffic. The trade can be conducted under these circumstances only with the utmost economy on the part of the producer and shipper, and increased demand could be met today only by increased pasturage.

THE COAL FIELDS SHOULD BE READILY ACCESSIBLE

The climate of all this region is healthful and agreeable, the living is good, the native labor is experienced in mining, such as it is.

The nearest seaport is Huacho; an attractive and busy agricultural center. The bay is of considerable extent, and the waters are smooth.

The distance from Oyón to Huacho is 93 miles, of which 35 miles from Huacho to Sayán are by railway, leaving 58 miles to be built from Sayán to Oyón over an easily accessible country. The difference in level between the latter points is 9843 ft.; a gradient averaging less than 3 per cent., being possible for the entire line and in some parts only 2 per cent. would be necessary. Waterfalls available for great electric power stations abound along the route.

With the opening of the Panama Canal, the establishment of a coaling port on the coast of Peru becomes imperative.

Essential Requirements of a Good Safety Lamp

In pursuance of the provisions of the coal mines act of 1911, tests have recently been made by a department committee appointed by the British Home Office (which corresponds to our Department of the Interior). It is not proposed that each individual lamp used in coal mines should be tested, but it is considered that no lamp should be adopted if it does not conform, in all particulars, to an official specification which is the direct outcome of a government test.

In order to maintain the proper standard, the committee is of the opinion that inspectors of mines should have power to seize any lamp which is being used in a mine and have it submitted to an official test. Should it be found to fall short, owing to its different construction from that of the samples of the same pattern previously tested, the question should be considered of canceling the certificate of approval granted to the maker.

The tests which the committee considers flame safety lamps should pass, fall under three heads: (1) Mechanical test, (2) photometric tests, and (3) tests in an explosive mixture.

MECHANICAL TESTS

In order to discover whether the lamp is capable of withstanding the conditions of rough usage to which it is likely to be submitted in a mine, it is proposed that it shall be submitted to three tests. First it is to be dropped, complete with its glass, from a height of 6 ft. upon a wooden floor five times in succession. A different glass is to be employed each time, and not more than one broken glass is to be permitted in the five tests. If two glasses break, the lamp is to undergo five more tests, and if the glass breaks in two of these it will be held to fail.

The second test consists in dropping a weight of 5 lb. from a height of 6 ft. vertically upon the lamp. If the glass is cracked the test is to be repeated twice, when one failure will condemn it. The third test is intended to try the security of the attachment of the different parts, and consists of dropping a 10-lb. weight, attached to a cord, from a height of 6 ft., the other end of the cord being secured to the bottom of the lamp, which is suspended at a height of 7 ft. from the ground.

Two methods for testing the glasses apart from the lamps, have been proposed. In the first a weight of 1 lb. is to be dropped from a height of 4 ft. upon them as they stand in a vertical position, and in the second they are to be heated in an air bath to a temperature of 212 deg. F. and plunged into water at 60 to 65 deg. In both these tests 20 glasses of each kind are to be tried, and in each case 10 per cent. of failures will cause rejection.

PHOTOMETRIC TESTS

The committee considers that the minimum candlepower to be required of flame lamps should be 0.30 (pentane standard), and that they should give this minimum for 10 hr. The lamps tested varied between 0.325 and 0.65 cp., the higher figure being given with naphtha as fuel and the lower with a mixture of half colza and half paraffin.

TESTS IN EXPLOSIVE MIXTURES

Two tests are proposed in order to determine the safety of the lamps in the presence of gas. The lamp, after passing the mechanical tests, is to be placed in an atmosphere which is inflammable and not moving. Then it will be tried in horizontal and inclined currents of inflammable gases traveling at a maximum velocity of 1200 ft. per min. Each test is to last two minutes, and, if gas is ignited, the lamp is to be rejected. The mixture is to be, within limits, the most explosive obtainable with the particular combustible gas or vapor employed.

In addition the committee holds that all approved lamps should ultimately have double gauzes of steel or best charcoal annealed iron wire (or copper wire in the case of those used for surveying purposes) of 28 B.w.g. (0.014 in. diameter) with 28 meshes to the lineal inch (784 to the square inch); but they suggest that this requirement shall not be enforced until Jan. 1, 1914. When lamp pillars are employed they ought to be so arranged that a straight line touching the exterior part of consecutive pillars will not touch the glass.

ELECTRIC SAFETY LAMPS

It is recommended that only the first of the mechanical tests be required for electric safety lamps, the test being carried out with the battery removed and a dummy of the same weight substituted. The lamp should be required to give not less than 1½ cp. after 10 hours' use, and as regards the danger of causing explosion it should be tested by having the light switched on and off while it is in an explosive mixture. Another requirement is that no liquid shall escape from the battery when the lamp is turned upside down, and the committee think it desirable that the light should be well distributed outside the lamp and that a movable reflector should be provided to concentrate or shield the light at will.

Machine for Shoveling Coal

In the issue of *Engineering News* of Sept. 5 is published the following table showing the tonnage shoveled by a machine built by the Myers-Whaley Co., Empire Bldg., Knoxville, Tenn. As the machine is well known to our readers, further quotation from the somewhat lengthy notice is unnecessary.

RESULTS OF A TEST OF A SHOVELING MACHINE FOR LOADING COAL IN A MINE

Date 1912	Places loaded out	Time consumed: Actual Loading		Cars Shifting		Moving	Tons loaded	No. of men
		hr.	min.	hr.	min.	min.		
May 8	5	4	47	0	54	23	147	4
May 9	4	3	55	0	49	9	120	4
May 10	4	3	56	0	40	18	114	4
May 11	4	3	24	0	46	6	102	4
Total	...	16	02	3	09	56	483	...

Total time loading, shifting and moving...20 hr. 7min.
Total coal loaded.....483 tons
Tons loaded per hour.....24.1 tons
This does not take into account any delays caused by pulling down coal or waiting on shot firing.

Who's Who—in Coal Mining

Devoted to Brief Sketches of Prominent Men, Their Work and Ideas

First among the few producing units in the anthracite fields of Pennsylvania is the Philadelphia & Reading Coal & Iron Co. In 1911, that corporation mined 13¼ million tons of coal or about 19 per cent. of the whole anthracite output.

This fact, aside from his personal worth, tends to make the life of W. J. Richards, first vice-president and general manager of this large organization, of extreme interest and of great moment.

As soon as Mr. Richards graduated from the high school of his native town, Minersville, he commenced to teach school, and at this work he was thorough in his methods and rigid in his discipline.

But it did not hold his allegiance long, for in the year 1882, he became a chainman of the Ashland division of the Philadelphia & Reading R.R., serving under Frank Clemens, who was at that time division engineer.

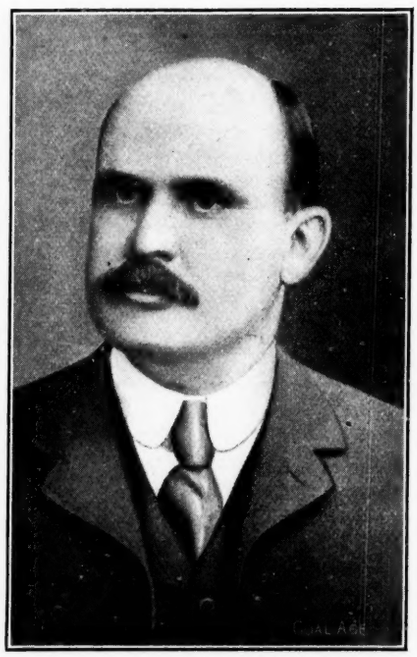
In 1887, he was offered a position with the engineering department of the Mineral Railroad & Mining Co. at Shamokin, but he returned to the Reading in 1888, to work in the office as draftsman and here he received his first insight into mining engineering.

In 1889, when T. H. Phillips, general superintendent of the Lehigh & Wilkes-Barre Coal Co. was looking for a chief engineer, Mr. Richards, on the recommendation of the interests for which he had been working, was tendered the position, which he accepted and occupied till 1898.

He acquitted himself so well that he was promoted to the position of general superintendent, succeeding Elmer Lawall, which post he vacated in October, 1902, to become, at the age of 42 years, the general manager of the Philadelphia & Reading Coal & Iron Co. Subsequently he became second and later first vice-president of the corporation.

Such is his career, but what of the man? The impression gained of Mr. Richards at close range is that of an untiring worker. He is not an idle onlooker at other men's labors. The chance has come to him, to rest from effort and watch the effect of other men's energies. But he cannot avail himself of such an opportunity. Those forces of industry, which put him where he is, still stir him to effort.

When he left Wilkes-Barre for the Reading, the officials held a banquet and presented him with a watch. One of the speakers who had worked with him, declared the gift inappropriate, for Richards never looked at a watch and hardly knew night from day.



W. J. RICHARDS

W. J. Richards is a powerful man, broad of shoulder and deep of chest, who immediately attracts attention wherever he goes by his physical power. He is just the build of man to go through life on his mettle, on the impression he makes on the visual organs rather than on his energy and real worth.

Many a man built with a physique like his has decided to rely on his frame and has traveled through life on the importance his appearance assured him. Not so the present head of the Reading coal operations, his body is used as a storehouse of energy. His mind is not dwarfed, as many are, by the size of the dwelling it occupies, but is quick to grasp all the pertinent facts, and to discern the correct solution of the problem at hand.

He is considered a keen judge of human nature. This is probably true, but many men have that reputation of judgment who have a quality just as rare and more valuable, that of molding the nature of others insensibly to their predominant wills. Mr. Richards has that power well developed. In his dealings with the miners he is patient and considerate.

He has been known to discuss the miner's train schedule with a coal miner for a full half a day. The man failed to get what he sought, but he left imbued with the impression that the head of the Reading corporation was reasonable and could be approached and was not indisposed to grant any favors which would appeal to him as of merit.

In such cases, it is more important that the employer's nature should be understood than the character of the employee himself. In fact, is not the employer too often an enigma like the sphinx? If his attitude cannot be read aright, unfortunate indeed is the result in the working of the industrial mechanism.

To Mr. Richards is largely due the institution of first-aid work in the coal mines of the United States. Under his leadership, the Reading company made that work a corporation interest and today there is no company which is training the men more efficiently than is the Reading.

There are in every organization men who are striving to do their work without that incessant application which is the source of success. These men are disposed to regard Mr. Richards as unsympathetic, as indeed he is to those who would like to drift easily to a better position. He has less interest in length of service than in energy. He has labored himself and still labors, why should not they also? They have forgotten that genius consists in 99 per cent. perspiration and 1 per cent. brain matter.

While Mr. Richards does not have a college education himself, he is not averse to those who have and many university graduates have a place in the service of the Reading. The chemical laboratories of his company are second to none in the anthracite region and numerous researches have been made to aid in the more efficient preparation of coal and in the fighting of mine fires by chemical means.

Outside of his duties Mr. Richards' interests lie mostly in outdoor recreation and exercise and the "simple life" has no more ardent advocate. He has a delightful cottage at Harvey's Lake in Pennsylvania, and there he spends in the summer what little leisure time he can be induced to take. He is a member of the Anthracite Conciliation Board, but that is his only interest apart from his corporation, for he does not dissipate his energies over the political and social field.

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This journal is interested solely in matters relating to the fuel industries, and is designed to be a medium for the free interchange of ideas, the detailed description of coal-mining practice, and the expression of independent thought calculated to benefit both operator and miner.

Contents

COAL AGE

The Situation in Anthracite

The anthracite companies have long been a conspicuous target for the ambitious trust-buster, who insists that they constitute an iniquitous combination for fixing prices and regulating production. Repeated attacks have been made upon the so called "hard-coal trust," in the form of suits by individuals and by the Federal Government. Though the United States Circuit Court has decided, in the latest and most important action, that the companies are not an unlawful combination, it cannot be questioned but that they are the object of considerable hostility on the part of the average consumer.

As a matter of fact, there is no industry today which has given such a practical monetary demonstration of its earnest endeavor to deal equitably with the public. In the face of the prevailing heavy demand, and consequent high price level, the companies are adhering rigidly to their circular, which ranges from $1 to $1.50 on the domestic grades, below the prevailing quotations offered by the independent operators. With an average monthly production now exceeding six million tons, this means a running net loss to the larger operators, at the rate of between 3½ and 5½ million dollars per month.

During the strike period of 1902, the companies consistently persevered in this policy even when the independents advanced their wholesale quotations to a level from $5 to $7 per ton above the circular. It is a significant fact that the principal anthracite companies maintain prices at an even level, while others are obtaining substantial premiums.

Concentration of capital in the coal industry is inevitable. Germany has long since conceded such by the organization of the Westphalia Coal Syndicate, through which one-third of the entire production of the Empire is sold. This syndicate has attained an efficiency in marketing that has resulted in a practically constant and equable price level and eliminated the ruinous competition that bankrupts many companies, as well as the abnormal prices which are in such popular disfavor.

In direct contradistinction to this latter may be cited the condition of our bituminous industry. There was, in 1910, a total investment of, roughly, 585 million dollars in this branch, which should net revenues of 75 million to insure an adequate return on the capital invested and cover depreciation and other fixed charges. The earnings were 16½ million, leaving a deficit of 58½ million. This loss must ultimately revert upon the public, either directly in the way of investments or indirectly through the exorbitant selling prices which prevail in times of a heavy demand.

It is a well known fact that the bituminous operators have long regarded the working agreement in effect among the anthracite companies with envious eyes, and many of the leading soft-coal men have not only placed themselves unequivocally on record as favoring such, but have taken active measures toward effecting a similar arrangement among themselves.

The much criticized selling plan of the anthracite companies is thoroughly comprehensive and built upon the soundest of business principles. The recurring stringency in the coal market during the fall of the year is not due to the lack of an adequate production capacity, as is the popular supposition, but to the abnormal strain upon transportation facilities, due principally to the heavy crop movement. Nor is there any possibility of this latter evil being remedied until the demand is made uniform throughout the year. The railroads already sustain serious losses due to the idleness of cars during most of the year, and it is unreasonable to either expect or demand that they make further heavy investments in equipment which could be used during only a few months of the year.

The anthracite producers, recognizing this fact, and also the universal reluctance on the part of the average consumers to purchase supplies in times of

slack demand, laid their plans accordingly. Thus, in spring and summer, the consumer is induced to store coal by an automatic reduction in prices, and it is only in this way that a satisfactory solution to the coal-famine problem will ever be attained. Since it is economically impracticable to increase the transportation capacity of the country sufficiently to eliminate a recurrence of this evil, the public must be educated up to the necessity of storing. Fully 75 per cent. of the domestic consumption of the country could be as conveniently purchased in the warm months as in winter, and the enormous total of the combined storage capacities of all the anthracite consumers is sufficient to warrant the assertion that a consistent adherence to this plan would effectively eliminate any famines in the future, and the hard-coal companies have attempted to force the issue by an appeal to the only vulnerable point of the consumer—his pocketbook.

The advantages of this selling method of the hard-coal companies are participated in by all concerned, from the miners to the consumer. The anthracite worker is assured constant employment the year around, a point his bituminous brother rarely has the good fortune to obtain. The small consumer is offered an opportunity to lay in his winter's supply at a minimum price. The railroads are relieved of the abnormal load, which always appears in the early fall, when the demand upon them from other directions is at its greatest.

Without crediting the companies with any altruistic intentions, it is nevertheless a pertinent fact that they are also important conservationists. The small producer wastes 1½ tons for each ton sent to the market, while the large unit, with adequate capital and an efficient technical staff, has been able to reduce this by one-half.

While complaints are general regarding the increased cost of coal, few consider that there may be any justification in this. The ordinary industrial manufacturer improves his equipment and methods year by year, gradually reducing his costs to the minimum, while in mining, the exhaustion of the surface coals compels the operator to sink deeper as time goes by, with the result that his costs are approaching the maximum. An analysis of the annual reports of any of the large companies over a period of years is sufficient to substantiate this. As an example, the case of the Reading company, the heaviest producer in the country, might be taken. In 1903 the net earnings of this corporation were at the rate of 53c. per ton; in 1906, 31c. per ton; in 1909, 26c. per ton, and in 1911, 15c. per ton.

What the situation will be this winter is as yet problematical and largely dependent on the supplies in the bins of the consumers. Were it not for the far-sighted policy of the companies, by which the consumer is prevailed upon to store during the summer, there would undoubtedly be much suffering. At the end of the suspension in May, the shipments of anthracite were 10 million tons behind those for the same period the year before. This shortage has been gradually diminished, until at the first of the current month it stood at about 6 million tons; had it not been for a series of petty strikes among the miners, it would have been still further reduced.

Six million tons represent a shortage of about 10 per cent., as compared with last year's shipments, but the consumption of anthracite is increasing on an average of 3 per cent. per annum, and business conditions have been such that it is reasonable to conclude that the past year has been no exception to this rule. The current shortage to date may, therefore, be conservatively estimated at 13 per cent. This is sufficient to justify some anxiety on the part of those concerned, but were the truth known, there is doubtless much more than this amount carried by consumers as reserve the year round, and providing there are no further interferences with shipments at the mines, the situation will not be critical.

The Quality Known as Americanism

Before the quality of Americanism gives its final gasp, it might be well to record what manner of thing it really is.

To an inquirer, the characteristic of the United States and in a degree of all new countries is the desire on the part of everyone in the body politic to do his very best. It is an ardent aspiration to effect a larger and better output than has been achieved before.

We think that is why American mines load from three to five tons per man employed, while the English collieries figure an employee per ton and many of the continental mines barely produce one-half as much. Perhaps that is why the bricklayer lays five times as many brick in America as he does in England.

The question is not so much one of ability, either mental or physical, as it is one of willingness. The foreigner comes here and shows himself even more productive than the native because he soon gets the American speeding quality.

We do not expect that anyone will continue to do his utmost simply because it is an American trait. No argument could be less logical and we would be the last to urge it. But is it not true that in the capacity for work and in our habit of seeking the ultimate result, is to be found at least a partial explanation of the fact that our artisans have had a better living than those of other countries?

For all we shall ever have is what we produce. If we, nationally, sow no seed, we shall as a people reap no harvest. If no grain is garnered, how shall we have a gristing; and if the mill ceases to grind whence shall we obtain flour, and if we have no flour, whence shall we procure bread?

Very simple are such arguments. Yet, to confound the wise there are schools of thought, which advocate reducing production and tell us gravely, but more often stridently, that we are all working too hard.

Last week, as we record elsewhere in our pages, several men struck at the Price-Pancoast mine, because they thought other men were loading too much coal. Now let us hear from the millers and bakers. Some millers probably think they are producing too much flour, some bakers are sure they are baking too much bread. Why do not these people also soldier on their job and spend the long days in listless labor? But as consumers of their product, we probably would prefer that they should not restrict their output to our disadvantage.

The canker is slowly entering into American life as it has already debilitated that of England. Unfortunately it is entering just when a depletion of resources has made the maintenance of our standards of living harder than ever to maintain. If we return to the European scales of output, we shall find it as hard as they to maintain the life of the workingman within the confining walls of his body.

Discussion by Readers

Comment, Criticism and Debate upon Previous Articles, and Letters from Practical Men

Should Mine Fans Be Built Reversible

Letter No. 18—I would state, unhesitatingly, that only under the most exceptional circumstances would I reverse the fan, at a mine giving off even a small percentage of firedamp; and, then, only if the men were out of the mine; or it was established as an absolute certainty that all the men in the mine were dead.

Consider, for a moment, the result of reversing a mine fan. The division doors, at the shaft bottom, dividing the intake from the return, would be forced open by the change of the current. This would short-circuit a large portion of the air, and the mine inby from that point would fill with gas. Under these conditions many men still alive in the mine would be smothered; this is a moral certainty.

The relation of an actual occurrence is often more convincing proof than a bookful of theory. I recall an incident, in my own experience, as follows:

An explosion had occurred in a certain gaseous mine, killing, I think, over twenty men. A rescuing party had recovered many of the bodies when, for some reason I do not now recollect, the mine inspectors decided it was necessary to fill the upcast shaft solid, up to a certain level, in order to prevent the gases and fire extending to another level. The exploring party were withdrawn from the mine and the work of filling the shaft to that level was quickly accomplished, as it was supposed. There was, however, a mistake in the measurement taken down the shaft to determine the depth to which the filling had progressed.

In a conference between the management and the inspectors, it was now decided to send a party into the mine. The circulation in the mine had been reversed by the material thrown into the shaft; and this, in turn, short-circuited the air current, and the mine filled with firedamp. Before the second exploring party was ready to descend, a second explosion occurred, due to a cause that no one could explain. It was assumed that a blower of gas had been ignited by the first explosion and that the reversal of the air current caused an accumulation of gas, which was carried back to the blower and ignited, causing the explosion. A few moments more would have added nearly a dozen lives to those killed by the first explosion. As it was, the second explosion killed all the horses, in the mine not affected by the first explosion, and another horse, in the mine where the original disaster occurred.

These and other similar instances convince me that the reversing of the air current should not be attempted, except under exceptional conditions.

JAMES ASHWORTH,
Mining Engineer.
Vancouver, B. C., Canada.

Letter No. 19—I offer the following as my opinion on the question of installing a reversible mine fan. I am in favor of the reversible fan and believe that the day is not far distant when the installation of such fans, at all mines, will be made compulsory by law. I regard it as a precautionary measure to assist in reducing mine fatalities, which must occur in the future as they have in the past. To contend against these, it is essential to equip the mine with every possible means of assistance and aid to human efforts.

The argument suggested in the Foreword, Oct. 12, that "some fool foreman might lose his head in an emergency," I consider of no value, because, probably, more than 99 per cent. of our mine foremen are not fools. They are men who, by hard work, study, grit, determination, energy, and the burning of the midnight candle, have raised themselves from the ranks to the position of trust they hold. They are, generally, men who have gone through the mill and, though not possessing the advantages of a college education, are still the highest type of practical mining engineers, today. The judgment of these men should be respected and relied on the same as that of a general entrusted with an army.

The suggestion that we should deprive the mine foreman of the advantage to be gained by a reversible fan, because of a possible fool foreman making a mistake, is ridiculous. I cannot believe that any mine foremen worthy of the name would attempt to reverse the fan without due consideration and consultation both with his superiors and assistants. The changing of the fan and consequent reversal of the air current while men are in the mine should only be done after assertaining the exact condition underground, as such act may jeopardize many lives.

In my own experience, I recall two explosions and two mine fires that occurred in mines in my charge; but in one case only did I consider it necessary to reverse the fan. This was in the case of a mine fire. I first had the fan slowed down, but did not order it reversed until I was positive all the men were safe outside of the mine. The fan was then reversed and run slowly with good results, as this gave the men a chance to get at the seat of the fire from the most advantageous point where the water supply and other conditions rendered their work more effective.

I can confirm and endorse the statement of Mr. McClusky (Letter No. 6, p. 582), where he says: "It is often necessary to change the direction of the air current so that rescue parties can enter the mine; and, in case of fire, to drive back the flame and gases and control the fire. The ventilation of a mine should be planned to meet any emergency that can reasonably be expected to arise in the operation of the mine."

To be prepared to meet any emergency means that the mine shall be equipped with a reversible fan, or other means be provided by which the air can be reversed. In many of our mines in the Northwest it has been proved by experience that a reversible fan can be used to great advantage, by making it possible to change the air on the approach of summer and winter. Many of our mines lie 1000 ft. below the surface, and the outside temperature, in winter, will often be from 20 to 40 deg. below zero. This makes possible an air column of nearly 200 ft., corresponding to a water gage of almost 3 inches.

One can readily see that these natural causes require careful consideration. I found, in one case, that the difference amounted to nearly 30,000 cu. ft. of air per minute in the circulation in the mine, summer and winter. Also, when necessary, this fan can be used to prevent the freezing of haulage roads and shafts in winter. Aside from other considerations, these conditions alone, from an economic standpoint, require the installation of a reversible fan, at practically all our mines.

As I have previously stated, in my opinion, the installation of reversible fans at mines should be made compulsory by law. This would give the mine foreman two chances instead of one. Thus far, I have not been favorably impressed with the arguments offered in favor of nonreversible fans.

A. W. POWELL, Mine Manager,
Columbia Coal & Coke Company.
Coalmont, B. C., Canada.

Letter No. 20—With reference to the question, "Should a mine fan be built reversible or not?" suggested in the Foreword of Oct. 12; and in response to the request then made for a full, free and fearless discussion, I submit the following as an outline of my thought in that connection.

That opinion on the question must be divided, seems clear in the start; because each debator will naturally consider those conditions with which he is most familiar. It is logical, therefore, to expect the verdict that reversible fans are of advantage under certain mining conditions, while other conditions would make such arrangement unquestionably a menace.

However, let us proceed to the discussion. To say, either, that no conditions exist or could exist in a mine, that would make the reversible fan desirable; or, on the other hand, to say that such an arrangement is advantageous under all conditions, would be to assume a knowledge of mining affairs far too intimate and comprehensive to sustain. Such broad and sweeping statements are bold assumption, born of ignorance; they are folly.

Every mine has, or should have, a ventilating system that is adapted to the peculiar conditions existing therein, and the particular work to be performed. There are, in coal mining, a great variety of conditions to be considered; and it seems hopeless to expect anything like unanimity of opinion, except on common ground. There are certain conditions in respect to fires occurring on an intake air-course and other climatic conditions that are common to all mines.

Money expended looking to the preservation of life, limb and property, is economy, insurance and good business, regarded from a commercial angle. From a human standpoint, it is unquestionable evidence of man's regard for his fellowman; and we are all human. For this reason, the additional outlay necessary to secure the reversible features of a ventilating fan plays little or no part in the argument.

Under some circumstances, a reversible fan would no doubt prove an instrument of destruction, in the charge of a "fool foreman"; but even that possibility can be exaggerated? Assuming that the installation of a reversible fan was considered desirable, at a certain mine, the only objection offered being a possible error of judgment, at a critical moment, on the part of those in charge outside, it would seem that adequate measures could be determined that would eliminate such a possibility.

To decide this question upon its merits and arrive at a satisfactory conclusion, one should consider the *greatest protection afforded at the least risk;* and in pursuing this line of argument each should say how such an arrangement would affect his own colliery. For instance, here in Rhode Island, we have no gas, use practically no timber; and the coal being anthracite, the dust does not explode. Under these conditions, a reversible fan at our colliery is feasible, practical and desirable. There are probably many places like this, where the reversible fan would be an unquestionable advantage. In such mines it may be necessary to reverse the air in the mine to control a mine fire or for any other reasons that would render the operation of the mine safer or more economical.

Conditions that might suggest a reversal of the air current, in an anthracite mine, may be either local or general; as for instance, a mine fire, gas explosion, or an invasion of blackdamp; but, usually, troubles of this character can be and are confined to the split of air in which they occur. Under some of these conditions, it would be extremely perilous to those employed in the mine, but located outside the immediate danger zone, if the fan were to be reversed by a thoughtless though willing helper. In all cases, where a reversible fan is installed it should be under the absolute control of some responsible person, and never changed except after due consultation with those fully acquainted with affairs in the mine.

Again, take a mine working two or three seams, some of which are giving off gas freely; and, say a fire starts in one of the seams. If the ventilation in all the seams is controlled by one reversible fan, should this fan be reversed? The question can be properly answered only by those intimately acquainted with all that might be involved by such an act. Or, suppose some condition arose that demanded the reversal of the air current as the *only* agent for good to the greatest number, and there was no alternative; then, in the absence of the means for reversing the air, we would be compelled to accept the consequences, however disastrous.

Now, in the anticipation of possibilities such as we have rehearsed briefly, let us ask, what should be the attitude of the operator concerning the installation of a reversible fan. To my mind, he should call a council of his most competent men and consider carefully all the possibilties that might call for the reversing of the air in the mine, and endeavor to reach a decision based on the *greatest protection afforded with the least risk*, and act on such decision.

In anthracite mining the situation is comparatively simple. Say a classification of the mines were to be made, and the mines listed as gaseous, semigaseous and nongaseous; then the question could be approached more intelligently. It might be said, reversible fans are applicable to nongaseous mines but not to gaseous mines. We would then have but the semigaseous situation to adjust.

Consider, now, bituminous mines and, for the sake of argument, let us admit that, in respect to mine fires and gas explosions, the necessity of reversing the air, in these mines, is equal to that in anthracite mines; then the question of installing a reversible fan would be the same in both anthracite and bituminous mines, as far as fires and gas are concerned.

But, how about dust explosions, which are a strong possibility in all bituminous mines? In anthracite mines explosions of dust are unknown, and a gas explosion is apt to be local and more easily controlled than in bituminous mines, where, on account of dust, an explosion generally becomes rampant. Under these conditions, should an explosion occur in a bituminous mine, of what avail are all the appliances for conducting and maintaining ventilation in the mine? These are likely to be destroyed and the circulation of air throughout the mine made impossible.

Why, at such a time, should we elect to be pinned down to either a "force" or "exhaust" fan? The drift mouths are vomiting smoke and flame; and the mine is a tomb of helpless, choking, bleeding, burning human beings. By which entrance shall rescue be attempted; and would it improve the situation were it possible to change the course of the air in the mine?

Bituminous men are most competent to answer these questions, as they apply particularly to their conditions; and I am sure that this discussion to which COAL AGE has called attention will prove of great value, especially to mines addicted to explosion.

We have read when boys, that something big (was it a city?) was lost, for the want of a nail. Recently four prominent men drifted to sea, in a motor boat, which had become disabled and the men were lost. Had a set of oars been provided they might have saved themselves: Moral: provide against every reasonable emergency.

Personally, I feel that: (1) No general answer, *yes* or *no,* would be acceptable. (2) The reversible fan is applicable to certain conditions, and offers great protection, in such cases, in time of danger. (3) Each colliery is a problem in itself; and the conditions prevailing therein must be weighed, against the possibility of trouble of a character that would call for the reversal of the air in the mine, before a conclusion can be reached based upon, *the greatest protection afforded with the least risk.*

H. D. JOHNSON, Genl. Supt.,
Rhode Island Coal Company.
Portsmouth, R. I.

Letter No. 21—I have read with increasing interest the letters discussing the question of reversible mine fans. Many of these letters have been written by men of wide experience. To my mind, the main point that has been brought out in this discussion is the uncertainty that exists in the minds of the unfortunate men trapped in the mine and of the officials on the surface, in regard to what either of these two parties is doing or intends to do. If the officials on the surface knew exactly the location of the men and the direction of their efforts to save themselves; or, if the men in the mine understood exactly what action would be taken by the officials and its effect in the mine, the case would be different.

This is a matter that cannot be trifled with. The doubt that exists in the minds of the officials as to the location and intention of the men in the mine makes it a practical impossibility for them to take any concerted action; and, for this reason, it appears to me the question of reversible fans, considered for this purpose, should be severely left alone. They are without doubt admirable for other purposes, as has already been shown.

I think, however, it would be more practical and advisable to install rescue stations in each district of the mine. These stations could be supplied with fresh air from the compressed-air line; or, if this is not available, connection should be made with the surface through boreholes large enough to permit the passage of air, food and water. A number of men in each district should have instructions to collect the men, in case of accident, and conduct them to these stations, which, if properly sealed, would keep the men safe until rescuers could reach them.

I believe sufficient attention is not given to the education and training of the large class of foreigners now employed in our mines. If more attention was given to the necessary training and examination of these men, it would go far toward reducing the number of fatalities in the mines. The efforts that have been made, in this respect, in Pensylvania, by many of the larger companies are commendable; but these efforts should be more general.

EDWARD COCKBURN.

Vivian, W. Va.

The Miner's Certificate

I have read with much interest the discussion of the miner's certificate, COAL AGE, Oct. 5, p. 467, and the suggestion of Mr. Johnson, that the mine inspector, on visiting the working places of the miners, should grant a certificate of qualification to every man whom he considers a good workman and a competent miner. I am of the opinion that the certificate of the miner does not count for much; in most cases, it is not worth the paper on which it is written.

I know from experience that a miner may be a good workman and understand how to keep his place in accordance to law, and may be able to instruct others and still fall short of the requirements of a good miner. The knowledge of what is required and the doing of what is required are two different things. I believe, however, thoroughly in the doctrine that a man who is capable of taking a situation as a miner should prove his ability by his work.

Mr. Gibson says, Nov. 9, p. 654, "If a miner does not do promptly what he is told, send a man to do the work and charge the expense to the miner." While that might work in some states, it would not do in Indiana. My experience teaches me that *tact* is essential in the handling of men; and it is often up to the mine boss or fireboss to avoid trouble. As a rule, men can be led but not driven. Suppose, for example, the mine boss on going into a miner's place, in the morning, and finding a heavy fall of roof, tells the miner: "It is your own fault, John, and you will have to clean up the fall or quit." The man stays out and the trouble is aggravated by the matter being referred to a committee to investigate, with the result that, in nine cases out of ten, the miner's place stands idle for two or three days, and, in the end, the company cleans up the fall and puts a new man in the place.

I am glad to see that my suggestion that a prize of, say $10 a month be offered by the company, is advised also by Mr. Gibson. Such a prize would arouse sharp competition among the men, and the company would see the benefit in less than two months. If properly managed, I believe it would tend to reduce mine accidents.

In speaking of prizes, the drivers and other company men should not be forgotten. The hope of gaining an extra dollar, once in a while, as a prize, will increase a driver's output from 60 to 70 tons a day. I have seen this method worked with a profit to the company. In one instance, where the mine was putting out 800 tons a day, the offer of a bonus of $10 to the drivers increased the output to over one thousand tons a day.

In dealing with men, let mine bosses remember that abuse of the men in their charge naturally leads to the abuse of any privileges accorded the men. Civil treatment on the part of bosses brings the same in return from the men. The constant effort of a good mine boss should be to maintain friendly relations with his men.

JOHN SUTTON.

West Terre Haute, Ind.

Decline in the Use of Coal

Some time ago, an article appeared in COAL AGE (Aug. 24, p. 246), discussing the possibility of a future decline in the use of coal. The steadily increasing demand for coal, at the present time, certainly does not show much tendency in that direction. However, the question is an interesting one and opens a wide field for reflection. In regard to the future use and demand for coal, there will doubtless be some differences of opinion. At the present time, it is the great source of power in the large majority of cases, even where electrical energy is employed.

Except where electrical energy is developed from water power, either coal or gas must be used to generate the electricity. But the supply of gas or oil, for the generation of our future power, must be considered as limited.

The great possibilities in the use of electrical power are evident when we consider the large loss in useful effect that occurs between the boiler and engine, in the use of coal for the generation of steam; and then reflect that there is a still greater waste of energy when that steam must be used to generate electricity. In regions where abundant water power is available for the generation of electricity, the loss of power in producing the current can be disregarded, because the original power is derived from a natural source.

Many railroads have experimented on the use of electricity for power, and today the electrification of steam roads is progressing at a rapid rate. Looking back over the past century, and observing the vast strides that have been made in art, science and industry, it is not difficult to look forward to a similar progress in the future, and to imagine that the time will come when electricity will furnish the chief source of industrial power, light and heat.

The telegraph, telephone and wireless of today make it hard to realize that less than 100 years ago the battle of New Orleans was fought six weeks after the Treaty of Peace was signed at Ghent, because the slow-going sailing vessel was the only means of conveying the news across the ocean. Likewise the 20th Century Express, flying from New York to Chicago in 17 hr., makes it difficult to believe that, in the early days, the trip from Philadelphia to Pittsburgh, by stage, required 20 days.

Speaking of coal, it is the great source of power today; and the mines are the natural storehouses of heat, light and energy. The world will mourn the day when this natural supply is exhausted.

S. U. PHILLIPS, Mine Foreman,
McKain Bros.

Hilliards, Penn.

Examination Questions

Selected from State Examinations, or Suggested by Correspondents

Examination for First Class Certificates, Held at Nanaimo, Cumberland, Merritt and Fernie, B. C., Canada, Oct. 29, 30, 31, 1912

(Selected Questions)

MINE CASES

Ques.—What is specific gravity and what are the standards or units of measure used: (a) For solids and liquids; (b) for gases?

Ans.—Specific gravity (relative gravity), as its name indicates, expresses the relative weight of a substance referred to the weight of the same volume of another substance taken as a standard. The adopted standards or units of measure are, (a) for solids and liquids, water at its maximum density; (b) for gases, air at the same temperature and pressure.

To illustrate, taking the weight of 1 cu.ft. of water as 62.5 lb., and the specific gravity of anthracite coal as 1.5; 1 cu.ft. of anthracite coal will weigh $62.5 \times 1.5 = 93.75$ lb.

Or, taking the weight of 1 cu.ft. of dry air (60 deg. F., bar. 30 in.) as 0.0766 lb. and the specific gravity of carbon dioxide (CO_2) as 1.529, the weight of 1 cu.ft. of carbon dioxide gas, at the same temperature and pressure, is $0.0766 \times 1.529 = 0.1171$ lb.

Ques.—How may the specific gravity of gases be calculated from the atomic (molecular) weight of the gas?

Ans.—Divide one-half the molecular weight of the gas by 14.4. The reason for this is that one-half the molecular weight of the gas is its density, referred to hydrogen as unity, and air is 14.4 times as heavy as hydrogen, at the same temperature and pressure. For example, the molecular weight of carbon dioxide (CO_2) is $12 + 2 \times 16 = 44$, and its density 22. Its specific gravity is, therefore, $22 \div 14.4 = 1.528$, approximately.

Ques.—What is the weight of 650 cu.ft. of marsh gas, at a temperature of 60 deg. F., the barometer being 29.5 in.?

Ans.—The weight of this volume of marsh gas (sp.gr., 0.559), at the given temperature and pressure, is

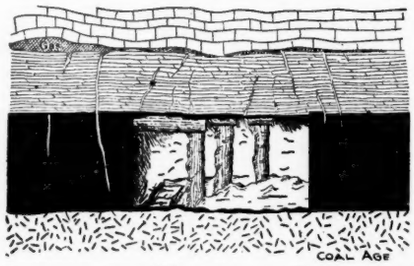
$$650 \times 0.559 \times \frac{1.3273 \times 29.5}{460 + 60} = 27.36 \text{ lb.}$$

Ques.—What would be the probable composition of the explosive mixture, if the afterdamp of the explosion shows the presence of whitedamp, instead of blackdamp, and why?

Ans.—The presence of whitedamp or carbon monoxide (CO), in the afterdamp, shows that there was not sufficient air in the firedamp mixture for the complete combustion of the carbon of the marsh gas. The complete combustion of the carbon requires a volume of air practically nine and one-half times the volume of the marsh gas. This proportion denotes the maximum explosive point of the firedamp. When the firedamp mixture contains a less proportion of air, the combustion is incomplete and whitedamp is formed.

Ques.—State the cause of sudden outbursts of gas in coal mines. What, in your opinion, should be done to prevent accidents from this cause?

Ans.—A sudden outburst of gas, in the mine workings, is generally the result of the disturbance of the strata, incident to the extraction of the coal. Gas occluded in the pores of the coal or other strata escapes therefrom and accumulates in pockets and fissures formed in the strata. The gas so confined in the strata is usually under great pressure. The accompanying sketch illustrates how this pressure is exerted



SHOWING THE WORKING OF GAS IN THE STRATA PREVIOUS TO AN OUTBURST

through the fissures formed in the coal and is distributed over a considerable area of the face of the coal or of the rib forming the side of the roadway. The gas in the strata always works toward the opening, and often escapes in large volumes through a crevice or fissure, thus forming what is called a "blower." At times, the outburst of gas is accompanied by a heavy fall of roof or coal, thrown down by the enormous pressure of the gas.

In order to prevent such a sudden outburst of gas in the mine, every effort should be made to drain the gas from the strata in which it is confined. To do this, drill holes are often kept several yards in advance of the face; and, at intervals, holes are drilled in the roof or the floor of the seam, according to the location of the gas. All openings should be driven narrow where there is danger of an outburst. Sufficient support should be given to the roof and the face of the coal, under these conditions.

Ques.—When gas is exploded, what effects are caused by coal dust suspended in the air?

Ans.—The coal dust suspended in the air and acted upon by the flame of the explosion distills carbon monoxide, which is burned at once to carbon-dioxide gas, provided moisture and sufficient air are present for the combustion. The presence of coal dust in the air not only widens the explosive range of the firedamp, making mixtures of marsh gas and air explosive that would not otherwise be explosive; but extends the flame of the explosion and increases its force or intensity.

Ques.—In what ways do various kinds of coal dust influence the character of an explosion?

Ans.—Coal dust suspended in the mine atmosphere, at the time and place of an explosion of gas or powder, increases the intensity of the explosion; and, by its own combustion, acted on by the flame of the explosion, distills carbon monoxide gas and lengthens the flame and propagates the explosion in the mine airways. The presence of the dust also widens the explosive range of the gas, making mixtures of gas and air that would not otherwise be explosive, violently explosive. The degree to which these effects are produced depends on the inflammability of the coal, the fineness of the dust, and the intensity of the flame of the original explosion, as well as the size of the openings or airways in which the explosion occurs.

Ques.—What is meant by the tension of gases, and what effect has compression on confined gases, the temperature remaining the same?

Ans.—The "tension" of a gas is the pressure to which that gas is subjected, or the pressure the gas supports. The compression of a gas increases its tension, in the same ratio. Thus, if two volumes of the gas are compressed into one volume, its tension is doubled. This law may be more clearly stated as follows: ***For a constant temperature the pressure ratio equals the inverse volume ratio.*** Thus,

$$\frac{\textit{first pressure}}{\textit{second pressure}} = \frac{\textit{second volume}}{\textit{first volume}}$$

Sociological Department

For the Betterment of Living Conditions in Mining Communities

Sociological Conditions in W. Va.

BY A WEST VIRGINIA ENGINEER

In my experience of coal mining in West Virginia and elsewhere I have found that the man interested in getting the most coal mined at the least ultimate expense has been handicapped by the limited supply of labor. Methods to be adopted to correct this condition are worthy of consideration.

There are exceptions, of course, but in general, the class of labor making up our mining population in West Virginia, whether English-speaking, or from southern or southeastern European countries, is of a lower order of intelligence than that in our immediately surrounding mining communities.

A satisfied employee is an asset to the employer, and the better satisfied, a large proportion of employees are, the less likelihood there is of them being willing to listen to and believe what is taught them by dishonest parties who welcome strife between employer and employee.

Housing and general living conditions are too often considered of little importance. Many houses are mere shacks, rough boards thrown together. No attention is paid to the protection of the tenants against the elements. The towns are oftentimes built without regard to drainage, one house fronting the back of another, with the filthy untended surface closet above, and the only source of water supply, shallow wells or springs located below, which naturally receive the drainage from the closets. Finally, a rentage rate is required such as invariably pays for the first cost, repairs, interest and taxes in from five to six years and serves to rebuild a house or two which in that time may have been consumed by fire.

In most "camps" no attention whatever is paid to the removal of filth and refuse from streets or alleys, if such are provided. Mud holes are tolerated, if not welcomed, and in general the more disreputable looking the shack row, the more "typical" it is. In short, no attempt is made toward instilling any idea of improvement or betterment. Rather, one is inclined to believe that the reverse is desired.

Any man appreciates and will respond to kind treatment, and if not too much corrupted by imposition and deception in the past will welcome any move by his employer tending to show that an interest is taken in his physical and mental improvement and in that of his family.

Too often it is thought that a man who can handle men is one who can get the most out of them by threats and impositions before they rebel. Brawn is considered a more necessary qualification for a good foreman, than brains. The mine foreman can, if inclined, be an instrument of wonderful good, both to his employer and community.

He is the man more intimately in touch with the employee than any other and can wield a great influence for good or bad over his men, and any example he may set, or any influence he may exert, is bound to bear fruit. The same interest should be manifested in working conditions as in the housing and comfort of employees. Discipline need not be sacrificed; and in fact discipline of the right kind, rightly applied, will be appreciated.

Man, of course, can be likened to a machine, and treated as such, within reasonable limits; but too often, we are unable to realize when that limit is reached. A certain amount of recreation or amusement is essential; as to what form it shall take depends upon the men being employed.

If it should happen to be drinking, carousing, and card playing, it is doubtless worse than no recreation at all. But in the numberless cases these are indulged in for want of something better. We have all seen many a mining camp, where the employees can find no healthy form of amusement during the evenings or idle days.

By many of the men in authority, any form of pleasure is frowned upon. Absence from work to participate in the same is considered a criminal offense and treated as such. In isolated camps, company owned, would it not be a good investment to provide indoor and outdoor amusements, conforming to weather conditions, and encourage participation therein?

By exercising judgment and by coöperation, it can easily be arranged that the working of the mine will not be affected, and much good will result from the better spirit instilled. These remarks apply, of course, only to those towns known as exclusively company towns, and these are greatly in the majority.

We often read and hear of, and have seen so-called "model mining towns" probably with brick houses, water supply, electric lights, bath tubs, etc. Instances have been cited where the bath tubs have been used for coal bins, and this is considered sufficient argument that these adjuncts of modern civilization are superfluous so far as the miner is concerned.

How many of us would know what to do, if, without previous preparation, we found ourselves in possession of a valet? Many of those who would cite the misuse of a bath tub as an argument against better housing conditions for miners would not know what to do with a finger bowl at the dining room of any second-rate hotel.

No, this is taking a step too far in advance. Improvements of this kind should be introduced with some consideration of the employees' "previous condition of servitude," and in cases where the number of employees justifies it, it would be feasible to have it a part of some one's duty to exercise a supervision and train them to an appreciation of better things.

For example, a common wash room located close to the mines, where the men could wash and change clothes would be a good stepping stone in this direction. The majority of the men would gladly avail themselves of the opportunity. If many did not, and the employee's welfare was in the same measure cared for in other respects, there would be no trouble to get men who would appreciate these things.

Why "A model mining town?" Why should a mining town differ greatly from any other village? True, its life may not be as long, but there are few plants of any consequence which will not last at least 20 or even 30 years.

The conditions usually considered ideal for building what is commonly spoken of as a "company town" are those where everything within a radius of several miles is owned by the operating company, and where the village is far removed from the houses and operation of any fellow operator.

Under these conditions, instead of following the usual custom of building and

owning everything in sight, the better plan would be to encourage the building of an independent town. Some houses owned by the company would be necessary, but the construction of these should be a secondary and not a primary consideration.

Arrangements could be made by which the tenant could pay for these houses in easy payments, if he so desired. The remainder of the lots could be sold or leased, and the miner encouraged to build upon them. But it is contended that in case of labor troubles and insubordination the operators would not have the control over the men which they otherwise would.

When a miner has something he can call his own, something he can improve, regardless of how humble or how good, he is going to appreciate his job the more and will take better care of it. He is not going to engage in labor troubles as often as if he had no interests.

He will not feel like picking up his tools and getting a job at the next mine when called upon by the foreman to do something which he may not at that particular moment feel like doing. If work is slack, he may go to some other place and work, but he will leave his family at home. When business improves and he is wanted he will always be on hand.

Under the other conditions, the company houses are emptied one by one, until the working force is diminished by half or more. When times are slack, men are turned away in order that the men who are working may get enough work to make a living.

But, when business begins to improve, the demand from the sales department becomes more and more insistent, the company wishes it had more men, and it is sometimes six months or more before a normal working force is obtained. By that time business is on the verge of another "slack time." At least that has been the experience during the last five years.

But some will say, most of the men now engaged in coal mining have no ambitions, are satisfied with little or nothing; are ignorant and do not want anything more than they already have; the kind of labor in mind always being what is commonly spoken of as the "foreign element."

Where the men so described have had the opportunity, they are as anxious to do well as the average native American or Anglo-Saxon ever was. The majority of men of this class have been away from the fatherland a sufficient number of years to become separated to a great extent from their ingrained and inherited ideas.

They are quick to "catch on" to American ways and methods and those arriving on our shores every day, learn now as much in one year as it formerly would have taken five years to learn. Conditions in this respect are different from what they were 20 or 30 years ago.

But, is intelligence among the laboring class in general, usually recognized as desirable? We would hesitate to make the unqualified statement that it is not, but at times we have been inclined to think so. We have often heard men referred to as "good men" because they would work under bad conditions indefinitely, without a protest.

Yet thinking people know that ultimately such men are the least profitable workmen to be obtained. There are a number of local and state institutes, primarily to train and educate foremen, superintendents and engineers, but we should have them also to improve the general personnel of that great bulk of our citizenship which is primarily the foundation of all our wealth.

The most prosperous country or community is the most intelligent. We cannot make Chesterfields of all our men, but we can make them more intelligent and thereby more efficient.

To quote: "None of us can really prosper permanently if masses of our fellows are debased and degraded, if they are ground down and forced to live starved and sordid lives, so that their souls are crippled like their bodies and the fine edge of their every feeling blunted."

There is not a thought expressed in all the foregoing that will not be considered impracticable and visionary by some. It will be called philanthropic and paternalistic by a great many. If men with money invested were in business only for today with no thought of the morrow, no doubt these suggestions would be to a certain extent visionary, but as we are almost all looking ahead for the welfare of our children and children's children, the development of the comfort and happiness of the working man is simply *business.*

Pittston Mining Institute

The Educational Department of the Pittston Y. M. C. A. has arranged for a class in practical mining, to be held on Tuesday and Friday evenings of each week. The first session of the class will be held on Tuesday evening, Nov. 19, and will continue until the time of the mine-foremen examinations next spring. The association has secured G. P. Troutman, assistant division superintendent and division engineer of the Lehigh Valley Coal Co., as teacher. The class will be open to all men who are interested in mining.

Treatment for Electric Shock

SPECIAL CORRESPONDENCE

In case of an electric accident, if a switch is near, cut off the current at once. If this is not possible remove the body of the victim by means of a dry piece of wood. If this cannot be done, lift whatever carries the current by means of dry wood; the dry handle of an axe or pick will do. If you find it necessary to grasp the body of the victim with the hands, protect them with several thicknesses of dry cloth and stand upon a dry piece of wood. If nothing else in the way of rescue can be done, short-circuit the line and blow out the circuit-breakers or fuses for that part of the system. This may be done by placing a drill or auger or piece of pipe in such a position as to connect the outgoing and return current.

As soon as the victim of an electric accident has been removed from contact with the current, place him on his back with all neck and abdomen bands loosened, place a small mine timber or rolled-up coat under the shoulders so as to raise the chest and throw the head back.

Grasp his tongue with a piece of dry cloth; draw it out in order to clear the wind-pipe. Pass a bandage or handkerchief over the tongue and under the jaw to hold it in that position, and proceed with artificial respiration.

The only sure way to avoid shock is to keep away from the trolley wires. Avoid unnecessary touching or handling of electrical machinery. Insulate the body while doing repair work; if possible, cut the current before handling the apparatus. Dry boards, free from nails, are an excellent insulation for the workman to stand on when repairing electrical appliances.

New rubber gloves, if not equipped with metal fastenings, are a good protection against shock. Rubber gloves worn thin, or leather gloves damp with water or perspiration, offer little protection. New rubber boots without nails in the soles or heels are good insulators, but if the soles are cracked or worn thin, they offer little or no protection. When adjusting electric machinery, if possible use one hand only

Objections to Safety Lamps

The safety lamp is not considered satisfactory because it can only give a small volume of light, of low temperature or feeble intensity, while the bottom portion of the lamp produces a shadow at an angle 30° with the plane of the horizon. The head of the miner being alternately upraised and lowered, causes his eyes to be in the rays of the light one moment and in the shadow the next. This produces irritation in the nerves and the muscles of the iris, and has, in course of time, an injurious effect upon his sight.

Coal and Coke News

From Our Own Representatives in Various Important Mining Centers

Washington, D. C.

Prof. Emory R. Johnson, the Isthmian Canal expert employed by the government, has made public his report, embodying the results of recent observations on the isthmus, and in the course of the document he discusses the relation of the fuel question to the choice of the Panama Canal route, as compared with the Suez route. Professor Johnson recommends a maximum toll of $1.20 per net ton upon loaded merchant vessels, and the President has issued a proclamation establishing that rate. In this connection and apropos of the question of tolls as bearing upon the fuel problem, he says:

Panama tolls should be so adjusted as to fulfill three conditions: The rate of toll should be low enough to enable the canal to compete actively with alternative and rival routes; the rate should not be so high as unduly to burden or seriously to restrict the usefulness of the canal; and, the rate should be high enough to yield revenues that will make the canal commercially self-supporting.

A toll of $1.20 per net ton on loaded merchant vessels and a reduction of 40 per cent. from the standard rate in the case of vessels in ballast will place the Panama Canal and its rival, the Suez Canal, upon an equal competitive footing. The Suez rates, beginning Jan. 1, 1913, are to be 6.25 francs ($1.206) for loaded vessels and 3.75 francs ($0.724) for ships in ballast.

The Panama Canal must compete with the Suez route for the commerce of the eastern seaboard of the United States and of the North Atlantic seaports of Europe with the Orient east of Singapore. For voyages between the eastern ports of the United States and the Orient, fuel expenses via Panama will be less than by way of Suez; and, with equal tolls at each canal, the Panama route will readily secure the traffic. It is not to be expected that much of the commerce of Europe with the Pacific seaboard of Asia can be diverted to Panama from its present route via Suez. Distances are less via Suez; and, with the exception of voyages from north Europe to Japan and return, the fuel expenses are lower by way of Suez. With equal tolls at Panama and Suez, some vessels will take the Panama route between Japan and Europe in order to discharge and secure cargo at American ports. To attract from the Suez to the American route any considerable additional share of the European-Oriental tonnage, the rates of toll at Panama would have to be made so low as to reduce unjustifiably the revenues of the canal. Neither traffic considerations nor probable financial results warrant the charging of lower tolls at Panama than at Suez, for the purpose of increasing the use of the American canal by the commerce of Europe with the Orient.

A Panama toll of $1.20 per net ton will not unduly burden the commerce served by the canal. The costs of transportation between the two seaboards of the United States will be reduced several times the amount of the toll; and, for the commerce of the eastern seaboard of the United States with western South America and with Australia, the economies effected by the Panama Canal will largely exceed the toll suggested. Likewise the saving in time and fuel expenses via Panama, as compared with the Magellan route, between our eastern seaboard and New Zealand will be such as to insure the profitable use of the Panama Canal.

Nor will a toll of $1.20 per net ton seriously restrict the use of the canal by European countries. For the commerce of Europe with Chile and with New Zealand, the saving resulting from the shortening of the time of voyage via Panama, as compared with the Straits of Magellan, would not warrant the payment of tolls of $1.20 per net vessel ton for using the Panama Canal; but the fuel expenses via Panama will be so much less than via Magellan as to make the canal route preferable, even with tolls of $1.20 per net ton. Moreover, the profitable trade route between Europe and Chile is via Panama and the ports intermediate betwen the Isthmus and Valparaiso. Panama is the natural entrance and exit for the west coast South American trade.

The normal growth of the traffic of the Panama Canal will not be interfered with by a toll of $1.20 per net ton. The tonnage of shipping using the Suez Canal has increased rapidly, the growth of traffic having been about 70 per cent. during the past 10 years, although the tolls at the opening of the decade were $1.74 per net ton, and, in 1911, $1.30—a higher rate than is recommended for Panama. It is suggested that the tolls at Panama start with the relatively low rate to which the Suez charges will have been brought in 1913, at the end of 43 years of traffic development.

Wilkes-Barre, Penn.

The Resuscitation Committee of the National Medical Association held a series of meetings in the anthracite field during the past week, meeting in Wilkes-Barre, on Friday, Nov. 15, in Pottsville, on Saturday morning, and at Drifton on Saturday evening. A large attendance marked the meeting held in the auditorium of the Lehigh & Wilkes-Barre Coal Co's. building, in Wilkes-Barre, on Friday, the various coal companies in and about Wilkes-Barre sending representatives to the meeting.

Thomas H. Williams, superintendent of the Kingston Coal Co., and president of the Wilkes-Barre Mining Institute, presided. Three captains of Lehigh & Wilkes-Barre first-aid teams gave a demonstration of the use of the pulmotor. The principal subject of discussion at the meeting was resuscitation, and demonstrations of the Shaeffer, Sylvester and Pulmotor methods were given.

The principal speaker was Dr. W. B. Cannon, of Harvard University, chairman of the Investigating Committee of the National Medical Association. He delivered an interesting and instructive talk, which was thoroughly appreciated by those in attendance.

Pennsylvania

Anthracite

Hazleton—Five hundred men and boys went on strike, Nov. 11, at the Jeansville colliery of the Lehigh Valley Coal Co. The strikers maintained that the wages of the motor runners have been reduced and that this is a violation of their agreement. The matter has been reported to the union officials and it is expected that the men will return to work pending a decision of the Conciliation Board.

Wilkes-Barre—The strike of the miners at the Dorrance colliery of the Lehigh Valley Coal Co., which was called Nov. 9, has been settled and the men resumed work Nov. 11. The detention was occasioned by the nonunion question. The officers of the Dorrance local will make an effort to induce those not in the Union to become members.

The miners at the Bellevue mine of the Delaware & Lackawanna Coal Co., who struck last week, have also returned to work.

Shamokin—One mule and ten wagons were swallowed by a cave-in near the Natalie colliery, Nov. 10, and a miner who was riding on the mule's back at the time narrowly escaped the same fate.

Bituminous

Ashville—The Altoona Coal & Coke Co. expect to charge 100 coke ovens that have been idle for over two years at a little town, formerly called Bakers Mine, not far from Ashville in the near future The ovens are now being repaired and will be put into operation just as soon as these repairs are completed. All will probably be in use by the first of the year.

DuBois—A deal has just been consummated whereby the Penn-Mary Coal Co., which has extensive holdings of mineral rights in Indiana County, dis-

poses of 11,820 acres of coal land in Pine and Buffinton townships to the Cherrytree and Dixonville Coal Co. The consideration is in the neighborhood of $1,000,000.

West Virginia

Charleston—The Department of mines gives the following report of the shipment of coal and coke from the four fields on the Norfolk and Western R.R. during the month of October: Pocahontas field, coal 1,216,961 tons, coke 103,076 tons, Tug River field, coal 194,511 tons, Thacker field, 230,991 tons, Kenova field, 84,777 tons. The total coal shipped was 1,727,340 tons and coke 103,076 tons.

Martial law was again proclaimed in the Paint Creek coal field Nov. 16, by Governor Glasscock where the miners are on strike. Ever since martial law was rescinded, there have been outbreaks of lawlessness and considerable gunpowder has been burned. There has been, however, comparatively few casualties.

Alabama

Birmingham—The sanitary committee of the U. S. Steel Corporation was recently in session in Birmingham for three days. The first two days the committee spent in going over the mines and other operations of the Tennessee Coal, Iron & R.R. Co., and the remainder of the time was spent in discussing matters pertaining to the betterment of conditions of the employees both in the plants and in their homes.

Ohio

Ironton—Probably the only two-year strike in the history of the United Mine Workers ended Nov. 11, when 300 to 400 miners of Lawrence County compromised with their employers in framing a new wage scale.

Ironton—On November 11, Capt. R. H. Browne was named receiver for the Pine Grove Coal & Mining Co. This company had made preparations for opening mines at Pine Grove.

Indiana

Sullivan—After dragging through the courts of Greene, Sullivan and Knox counties, the suit of I. O. Price against the Summit Coal Co. has been settled. The coal companies must henceforth pay a royalty to Price.

Evansville—A suit was filed in the Circuit Court, November 11, asking that a receiver be appointed for the Banner Coal Co., alleging that the company is insolvent.

Illinois

Danville—The four Bunsen mines at Westville established a record during the month of October. During that month the four mines took out 206,000 tons of coal. The Vermillion mine leads with 71,795 tons during the month, which is the largest output of any mine in this section of the state.

East St. Louis—The Aluminum Ore Co. of East St. Louis has purchased the large farms of G. F. Paul and William Fulton near Marissa, southeast of Belleville. The company will within a few weeks begin sinking two large coal mines on the property.

Springfield—A merger of 25 of the principal coal mines of Sangamon County may be effected as the result of Frank S. Peabody, head of the Peabody Coal Co., obtaining options on the mines. The options will total $3,500,000.

Allerton—A splendid bed of coal has been discovered near this village at a depth of 215 feet and there is some talk of forming a company to sink a shaft. The exact thickness of the vein is not known but tests will be made to determine this point.

Oklahoma

Muskogee—Following the report made by Inspector Linnen as to the conditions of the coal-land affairs in the Choctaw and Chickasaw nations, and the rumors that the appraisers were not working in harmony and that some valuable advance information was being given out, Joseph W. Howell, assistant attorney in the Department of the Interior has been commissioned by Secretary Fisher to make a complete investigation in eastern Oklahoma.

Colorado

Lafayette—In a gas explosion in the Simpson Brooks coal mine, Nov. 8, J. W. Higgins, a shift boss, was killed while superintending a fight against the fire that had started in an entry late that afternoon. Five others were seriously burned, but will recover.

Denver—With 127 coal-mine owners, operators and employees, from vice-presidents to miners, from Utah, Colorado, Wyoming and New Mexico present, and nearly 150 applications for nonparticipating membership, the Rocky Mountain Coal Mining Institute was organized with a full quota of officials in the assembly room of the House of Representatives at the State House, Nov. 13. A full account of this meeting will appear in the next issue of COAL AGE.

Foreign News

Cardiff, Wales—Failing in its attempt to win the recent coal strike in South Wales, the Miners Federation on Nov. 13 adopted a resolution cutting the salaries of its officers 50%. The officers retaliated by declining to accept the reduction and announced that they would inaugurate a strike of their own.

Edmonton, Alta—The Grand Trunk Pacific branch, connecting the main line at Yellowhead, with the property of the Pacific Pass Coal Co., a distance of about 38 miles, is practically completed and the company, which is one of the subsidiaries of the Canadian Coal & Coke Co., will probably be shipping in a few days.

Personals

J. W. Coon, assistant to the general manager of the Baltimore & Ohio R.R., with headquarters at Baltimore, has become chairman of the general safety committee of the Baltimore & Ohio.

George P. Atkinson, president of the St. Bernard Coal Co., delivered an illustrated lecture on coal mining at the recent monthly meeting of the Transportation Club, which was of considerable interest.

William H. Skaggs, of Chicago, Ill., who is interested in a large body of coal lands in Tuscaloosa and Fayette Counties, Alabama, has been spending several days in Birmingham recently in connection therewith.

Frank G. Jones, president of the coal company which bears his name, was recently accorded the honor of election to membership in the Rotary Club, of Louisville, a business and social organization which is distinguished, among other respects, in that only one man from each line of business in the city is eligible for membership.

E. P. Williams, of Birmingham, Ala., resigned his position last week as superintendent of foundry furnaces (Alice, Oxmoor and five at Bessemer) for the Tennessee Coal, Iron and Railroad Co., and expects to go North to locate. He is succeeded temporarily by Mr. William E. Hadley, assistant superintendent of the Ensley furnaces for the same company.

Construction News

Pottsville, Penn.—Dolan Brothers, of Pottsville, have been awarded the contract to sink an 800-ft. air shaft at the Lytle colliery.

Ashland, Ky.—The Semet-Solvay Coke Co. will build a byproduct coking plant here to coke the coal from Jenkins, the new development of the Consolidated Coal Co.

St. Marys, Penn.—Andrew Brehm, a contractor, of St. Marys, Penn., has been awarded the contract to build a large coaling tipple for the Pittsburgh, Shawmut & Northern R.R., at Elbon.

Thomas, W. Va.—The Davis Coal & Coke Co. will develop its Garrett County, Md., coal property at the expense of $300,000. This property is located within three miles of the operations here.

Connellsville, Penn.—Extensive developments of the coal fields of Greene County, Penn., and Monongahela County, W. Va., are expected to begin soon after the first of the year, according to officials of the Buckhannon & Northern and Pittsburgh & Lake Erie railroads.

Brownsville, Penn.—A rumor is current to the effect that a coke plant is to be constructed near Big Meadow Run, a point on the Monongahela R.R., a few miles south of town. T. B. Young, of the Brownsville Engineering Co., is the engineer in charge of the preliminary work on the proposed plant.

St. Joseph, Mo.—A project is on foot here to connect St. Joseph with the great Cainsville coal field, and a corps of surveyors are going over a line of proposed steam railway. In addition to the expected tonnage from the coal field, the line will traverse a fine prairie country for nearly its entire length.

Columbus, Ohio—The Hocking Valley R.R. Co. has practically determined to double-track its line between Columbus and Toledo, and this work is expected to be completed by the time the new docks and terminal facilities are finished at Toledo. The double-tracking is made necessary by the increased coal traffic on the northern division.

Hamden, Ohio—With a view to opening up a new coal field in the Pomeroy Bend, owned by the Ebersbachs, it is said that Jno. Lindsey, of Pomeroy, has received a contract from the Hocking Valley Ry. Co. to extend its line from Kerr's Run, a distance of 12 miles, out through Nease Settlement, thus tapping and furnishing an outlet for one of the biggest coal territories in the state.

Tuscaloosa, Ala.—The new furnace of the Central Coal & Iron Co., at Holt, which has been under construction at the cost of $300,000, since last May, will be ready for operation in a few days. It is understood that a second furnace is to be erected to supply the additional wants of the company, but nothing definite along this line has been heard.

Birmingham, Ala.—The Bryan Coal Corporation announces that $100,000 will be expended at once in the opening of a new mine on the Warrior River, west of Birmingham, increasing the daily output of the company at Red Star, on the Southern Ry., alone to 1000 tons of coal. Houses will be built for the employees and employment given to 300 men.

Fort Wayne, Ind.—The foundation for the new Wabash coal dock, which will be built west of the present dock, has been finished, and the work of erecting the new dock will be rushed for completion. At the same time the old dock will be torn down and a clam-shell derrick used to supply fuel to the engines until the new docks are ready for operation.

Columbus, Ohio—Plans have been completed by the Hocking Valley R.R. for the construction of an extension of its line to open up what is believed to be one of the largest coal territories in the state in the Pomeroy Bend district. Contracts, it is said, have been awarded to John Lindsey, of Pomeroy, for the construction of a spur line from Kerrs Run, a distance of 12 miles out through Nease Settlement.

Helena, Ala.—The Connors-Weyman Steel Co. is opening two new slope mines on the Blocton Mineral R.R., 19 miles from Birmingham. One of these slopes is on the Helena and one on the Conglomerate seam. Quite a force of men are now at work clearing ground for a new tipple, etc. Six 150-hp. boilers will be installed, together with electric generators, pumps, etc. Three grades of coal—lump, nut, and slack—will be made, and it is expected that each slope will turn out about 600 tons daily. T. F. Wear is superintendent and G. W. Postell, construction engineer.

Birmingham, Ala.—A large factory, foundry and machine shop company, to be devoted to the manufacture of coal washing plants of an improved type is being organized by John G. Cooke, president of the Universal Mortgage Bond Co., and treasurer of the Southern States Fire Insurance Co. Capital, $200,000.

Site has been selected for plant and plans are being prepared. Between 50 and 75 skilled mechanics will be employed. It is claimed a number of experts have passed upon the new type of washer, as being better and simpler than any other on the market, and the cost will be considerably less.

Pittsburgh, Penn.—Two important new railroad projects have just been authorized, which will vitally affect Pittsburgh, and will mean an outlay of nearly $10,000,000. Surveys have been completed, and they are both practically in a shape to be placed in the hands of contractors.

Incidentally one of these lines opens the vast tract of unmined coal held in reserve by the Pittsburgh Coal Co., and gives it an independent outlet to the lakes by the Bessemer R.R.

While this project has been under way the Pittsburgh & Lake Erie R.R. has come into the same territory with a plan to build a bridge across the Monongahela River, at Mingo Creek, between Monongahela and Clairton.

Calgary, Alta., Can.—During the past summer, surveys were completed for a new railroad starting from the Mormon town of Carsden, near the southern boundary of Alberta and running north to Calgary. This line will tap the agricultural, timber and coal lands. The coal lies in the Livingston Range, to the east of the main range of the Rockies, and considerable work done since its discovery has demonstrated the existence of large bodies of valuable coal, similar in quality to that of the Crows' Nest. The contracts for the construction of this new line will probably be let next spring and it is probable that in the near future this line will be extended to reach the Elk River coal lands.

Ogden, Utah—President William G. Sharp, of the U. S. Smelting & Refining Co., said in an interview recently that the new coal property lately acquired in Utah is making gratifying progress, especially the new ninety-mile coal road that is to tap the coal deposits in Emery and Carbon Counties. Final surveys are being perfected, and contracts for two sections of road, involving about 37 miles have been placed. It is estimated the entire line should be in operation by 1914.

At present the three mines are producing from 60,000 to 65,000 tons per month and by the time the road is complete, Mr. Sharp expects to be in shape to ship at the rate of 1,000,000 tons of coal per annum. Experts estimate that the property contains 150,000,000 tons of coal, the seam varying in thickness from 20 to 30 ft.

New Incorporations

Washington, Penn.—City Coal Co., Washington; capital, $5000.

Greenwood, Ark.—Greenwood Semi-anthracite Coal Co.; capital, $1000. Dealers in coal.

Wellsboro, Penn.—Rock Run Coal Co.; capital, $70,000. To mine coal on properties located along Rock Run.

New York City—Alaska Mines Co.; capital, $1,000,000. Incorporators are: G. T. Cappell, Cordova, Alaska, T. F. Fox, J. P. Madigan, Cleveland, Ohio.

Mishawaka, Ind.—Frank Lumber & Coal Co., Mishawaka, Ind.; capital, $20,000. Directors are: Oren G. Huff, Grandville; W. Ziegler and Ralph H. Jernegan.

Portland, Maine—Great Lakes Dock & Fuel Co., Portland, Maine. Mining and dealing in coal, wood, timber, etc.; capital, $500,000. Pres. and Treas., F. T. Eaton, Concord, Mass.

Camden, N. J.—Amalgamated Collieries Co., Camden, N. J. Mining, etc.; capital, $1,000,000. Incorporators are: G. T. Eager, Philadelphia, Penn.; E. H. Davidson, T. B. Hall, Camden, N. J.

Le Grange, Ind.—The Indiana Mining & Development Co. has been incorporated at La Grange, Ind., with $12,000 capital stock, to operate mines. The directors are: A. R. Wyatt, I. J. Vaughn and G. H. Lynch.

Wilmington, Del.—Finley Lumber Co., Philadelphia, Penn.; capital stock, $50,000. To purchase, lease, sell and deal in timber or mining lands. Incorporators are: James A. Finley, Philadelphia; Levi L. Malone Townsend, Geo. L. Townsend, Jr.

Wilmington, Del.—Maryland Land & Timber Co., Wilmington, Del.; capital stock, $100,000. To mine or otherwise extract and remove coal and minerals from mines, etc. Incorporators are: H. Ralph Ewart, Clarence J. Jacobs, Harry W. Davis, Wilmington, Del.

Centralia, Wash.—Articles of incorporation were filed at Centralia, Wash., this week by the Washington Coal Mining Co., a Seattle corporation. The capital stock is $30,000 and the incorporators are: A. H. McCoombs and B. A. Brown, of Seattle, and J. E. Bennight, of Centralia.

Huntington, W. Va.—Coal & Timber Co., of Huntington, W. Va., to purchase and operate coal lands, lease gas lands for the purpose of operating them. Authorized capital, $5000. Incorporators are: A. B. Hyman, S. J. Hyman, I. S. Hyman, J. H. Strickling and G. I. Neall, all of Huntington, W. Va.

Phœnix, Ariz.—The South American Mines Co. has been organized with a capitalization of $30,000, and F. F. Crist, C. W. Coxe, E. H. Henshaw, H. W. Foster and P. E. Cox are directors. The principal place of business will be Phœnix, Ariz., and the object, among other activities, will be the mining of coal.

Charleston, W. Va.—Decota Coal Co., of Philadelphia, Penn., to mine coal in Roaring Creek district, Randolph County; authorized capital, $15,000. Incorporators are: D. P. Stanton, of New York; Wm. J. Fraux and E. M. Sanders, of Philadelphia; E. A. Bousher, Beaverdale, Penn.; Jno. E. Evans, of Ebensburg, Penn.

Charleston, W. Va.—Consolidated Realty Corporation of West Virginia, of Charleston, W. Va., to deal in real estate, coal, oil, gas and timber lands, stocks and bonds, act as agents for others, etc. Authorized capital, $25,000. Incorporators are: F. J. Owen, J. G. Wingfield, L. J. Falone and J. F. Bedell, of Charleston, and F. T. Rice, of Butler, Penn.

Corry, Penn.—A. B. Ragon, of the Alden Ragon Coal Co., of this city, has organized a company to be known as the Ragon Coal Mining Co., and has entered upon the operating field. The new company has purchased of the Hamilton Coal Co., a large tract of coal land in Butler County, underlaid with rich deposits of bituminous and cannel coal.

The property is fully equipped with electrical mining machines, buildings and tipple practically new. The present capacity of the mines is 200 tons. The new owners will increase the capacity of the mines. The general office will be located in this city and the Alden Ragon Coal Co. will be exclusive agents.

Industrial News

Pittsburgh, Penn.—The old Solomon Paulin coal mine and farm of 110 acres will be sold at public sale Nov. 20.

Evansville, Ind.—F. J. Jourdan, a large stockholder in the Banner Coal Co., sued for a receiver, Nov. 12. He claims the company is insolvent.

Leechburg, Penn.—The Realization Co., of New York, has purchased coal mines here and at Aladdin on the Allegheny River for about $400,000.

Chicago, Ill.—The Southern Ry. is reported to have closed for 40,000 tons of standard rails. The Tennessee Coal & Iron Co. will roll most of the order.

Frenchville, Penn.—F. F. Coudriet offers for sale 50 acres of coal land and all mineral at $30 per acre. Privilege is granted to put a drill on the property for testing.

Belleville, Ill.—The Aluminum Ore Co., of East St. Louis, has purchased the 200-acre farm of G. F. Paul, southeast of Belleville, to sink a coal mine. The company has options on other coal lands in that vicinity.

Connellsville, Penn.—Sheriff J. M. White, of Greene County, has advertised the property of the Dilworth Coal Co. for sale. The amount of the judgment is $362,500. The property of the company is valued at $1,000,000.

Marion, Penn.—Savan Coal Co., which recently purchased the Lowry coal, commenced last week to open up new mines. David Herron, who has been connected with the mines at Dixonville for some years, is foreman at the new mines.

Albion, Mich.—Eighty men will soon find employment in the coal mine north of this city, work on which has progressed so far that 35 ft. of the main shaft has already been sunk. The Lake Shore R.R. will build a spur to the mine.

Cincinnati, Ohio—Receiver A. A. Ferris has been directed by Judge Hollister to proceed at once with the sale of the Dominion Coal Co.'s property, near St. Charles, W. Va. The lowest bid which may be accepted by the receiver is $55,000.

Rogers, Ohio—Owing to the non-arrival of the trolley motors for hauling coal to the surface of the Quaker Valley mines, operations will not begin until Dec. 1. The power house has been completed at the mine and machinery installed.

Shadyside, Ohio—Another large mine is to be opened in Belmont County within the next few weeks. The Cambria Coal Co. owned by the George M. Jones Coal Co., of Toledo, will open a mine on the Andrew Jackson Brown farm, southwest of Shadyside.

Johnstown, Penn.—The opening of new mines and other improvements by the Meyersdale Coal Co., at Friedens, is looked for as a result of the closing of a deal with F. F. Smith for the purchase of 120 acres of coal land for $11,000. It is close to the Stauffer bore and the Wellscreek mine.

Cardiff, Wales—Russia, Germany and Italy are placing unusually large orders for Welsh coal. The Russian order for 30,000 tons is to be sent to Odessa. This fact has attracted particular attention, since no Welsh coal has been sent to that port in many years, owing to the prohibitive import duty.

Hazard, Ky.—J. L. Coleman, of Knoxville, and J. P. Gorman, of Jellico, Tenn., are preparing to develop a tract of coal land up Messer branch, out of Hazard. They expect to be ready for operations by spring and to be in a position to ship 500 tons a day when the next season's coal trade opens up.

New Eagle, Penn.—B. S. Hammill Co., of Pittsburgh, broke ground Wednesday for a new coal mine on the Wallace farm, below New Eagle. Matthew Herron, who was formerly connected with the Monongahela River Coal Co., is to be superintendent, and B. S. Hammill, of Pittsburgh, general manager. The mine will be equipped with electricity.

Louisville, Ky.—The approach of winter has had the effect of checking operations in the way of development of new territory in the eastern part of the state, to a considerable extent. While the new mining settlements which have sprung up as a result of the great amount of territory opened during the past year are prospering, a lull during the winter months is expected.

Big Stone Gap, Va.—C. B. Slemp, of Big Stone Gap, Va., is interested with others in a tract of 30,000 acres of coal and timber land in Perry and Letcher Counties, Ky., the immediate development of which is under consideration. Details have been discussed, and it is reported that the preliminary work of installation of a number of mines will be started at once.

Rockwood, Penn.—James A. Kirkpatrick, for several years past superintendent of the Southern Coal Co.'s mines at Casselman, has leased a tract of coal land from the Brandenburg Coal Co., near Rockwood, along the B. & O. R.R., and has already begun a new mine opening. The lease also includes the old Pennwood Coal tipple and siding, which will be used for loading purposes.

Johnson City, Ill.—The Furlough Coal Co., a New York corporation, has acquired the property of the Lake Creek Coal Co., the consideration being $100,000. In addition, the new owners have purchased 600 acres for a consideration of $45,000, making the total acreage between 1000 and 1100 acres. The property has not been operated for two years and it is understood the new owners represent some of the Gould railways.

Pottsville, Penn.—At the instance of M. T. Brown, of Philadelphia, a bill in equity has been filed against the Schuylkill & Lehigh Coal Co., operating a colliery at Tuscarora. The plant and land is owned by Benjamin Lyman, of Philadelphia, and has been operated by a stock company, of which J. P. Lenahan, of Wilkes-Barre, is president. Judge Bechtel has decided to appoint a receiver for the company.

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Coastwise bituminous shipments are so small that some of the coal companies are offering their fleets for rechartering. While there is an obvious dearth of supplies, the market varies so spasmodically, that it would seem to indicate a speculative element in control. There has been a freer movement to tide, some spot business has developed, and operators are giving better shipments on contracts.

With the close of Lake navigation now so close at hand, there is some uneasiness in the Pittsburgh market; prices are tending to fluctuate, and operators are, therefore, willing to contract over a few months at prices somewhat under quotations for the year because they would be obliged to ship during the Lake season. Spot coal is so scarce there that the market is not quotable. The car shortage is again in evidence in Ohio, and the situation is now probably more acute than at any time during the season, and the available supplies have quickly depleted.

Operators shipping the Hampton Roads market are being pushed by their Western connections for final shipments before the close of navigation, while the tidewater demand is so heavy that detention of from three to four weeks is becoming quite common. The supply of anthracite in the Middlewestern markets is so short, that substitutes will have to be used during the coming season. The bituminous trade is firm, and the recent cold weather will undoubtedly create an active demand.

Boston, Mass.

The latter part of November sees a tightening up all along the line on bituminous. Receipts of Pocahontas and New River are small and one of the largest of the West Virginia agencies offers to re-charter its fleet of steamers because its own coal is not coming down in sufficient volumes to load them. Other shippers have large vessels waiting at the Hampton Roads piers now for the third and fourth week, and in many ways the situation is grave. It is probably only a question of a short time when there will be an active market here for spot coal from the Pennsylvania fields. Georges Creek shipments are extremely light and car supply continues the chief factor in that region. It is said that beginning Jan. 1, there will be in all thirty-one steamers in the coastwise bituminous trade, representing a carrying capacity of about 5,400,000 tons a year. This will certainly have a softening influence on freight rates.

The anthracite situation here is fast getting acute. The long-expected early winter demand from the consumer has begun and from now on there are likely to be strenuous times. The dealers who ordinarily stop taking coal Dec. 1, on account of the rivers freezing, are counting this year on receiving supplies through the winter at the nearest open ports where coal can be put on cars. It is unlikely, therefore, that the demand will be diminished in the least until spring.

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New York

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Anthracite—The situation in hard coal continues monotonously in the same channel. The long promised relief to the shortage has failed to materalize so far, but with the discontinuance of shipments in the Lake trade this week, it is reasonable to expect a noticeable improvement in the arrivals here. Domestic grades still continue in the same heavy demand with no apparent prospects of letting up. The weather became somewhat colder during the week, and this caused a small rush for the domestic product, which tended to tighten the situation still further. The steam sizes are fairly active and in good demand.

Hard-coal quotations at this point continue unchanged as follows:

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Bituminous—Shipments for the Lake trade will practically stop with this week, or will at least so decrease as to make an entire change in the situation. The pressure continues to ship every ton possible and prompt coal is as difficult to secure as ever, but some unevenness in the market for prompt shipment is naturally to be expected after this week. Some operators, therefore, have been ready to book contracts for limited periods at prices lower, probably, than they would accept for delivery over an entire year, thus including another Lake season. On deliveries over, say, three months, December, January and February, $1.25 is about the asking price for mine-run, but it is not impossible it would be shaded somewhat. Prompt coal has been so scarce as not to show any regular market, but occasional sales have been made of slack at $1.25, nut at $1.60, mine-run at $1.75 to $1.80, and ¾-in. at $1.90. A feature of the situation is that practically no slack has been accumulated, though usually some operators accumulate a large stock during the Lake shipping sea-

Corry, Penn.—A. B. Ragon, of the Alden Ragon Coal Co., of this city, has organized a company to be known as the Ragon Coal Mining Co., and has entered upon the operating field. The new company has purchased of the Hamilton Coal Co., a large tract of coal land in Butler County, underlaid with rich deposits of bituminous and cannel coal.

The property is fully equipped with electrical mining machines, buildings and tipple practically new. The present capacity of the mines is 200 tons. The new owners will increase the capacity of the mines. The general office will be located in this city and the Alden Ragon Coal Co. will be exclusive agents.

Industrial News

Pittsburgh, Penn.—The old Solomon Paulin coal mine and farm of 110 acres will be sold at public sale Nov. 20.

Evansville, Ind.—F. J. Jourdan, a large stockholder in the Banner Coal Co., sued for a receiver, Nov. 12. He claims the company is insolvent.

Leechburg, Penn.—The Realization Co., of New York, has purchased coal mines here and at Aladdin on the Allegheny River for about $400,000.

Chicago, Ill.—The Southern Ry. is reported to have closed for 40,000 tons of standard rails. The Tennessee Coal & Iron Co. will roll most of the order.

Frenchville, Penn.—F. F. Coudriet offers for sale 50 acres of coal land and all mineral at $30 per acre. Privilege is granted to put a drill on the property for testing.

Belleville, Ill.—The Aluminum Ore Co., of East St. Louis, has purchased the 200-acre farm of G. F. Paul, southeast of Belleville, to sink a coal mine. The company has options on other coal lands in that vicinity.

Connellsville, Penn.—Sheriff J. M. White, of Greene County, has advertised the property of the Dilworth Coal Co. for sale. The amount of the judgment is $362,500. The property of the company is valued at $1,000,000.

Marion, Penn.—Savan Coal Co., which recently purchased the Lowry coal, commenced last week to open up new mines. David Herron, who has been connected with the mines at Dixonville for some years, is foreman at the new mines.

Albion, Mich.—Eighty men will soon find employment in the coal mine north of this city, work on which has progressed so far that 35 ft. of the main shaft has already been sunk. The Lake Shore R.R. will build a spur to the mine.

Cincinnati, Ohio—Receiver A. A. Ferris has been directed by Judge Hollister to proceed at once with the sale of the Dominion Coal Co.'s property, near St. Charles, W. Va. The lowest bid which may be accepted by the receiver is $55,000.

Rogers, Ohio—Owing to the non-arrival of the trolley motors for hauling coal to the surface of the Quaker Valley mines, operations will not begin until Dec. 1. The power house has been completed at the mine and machinery installed.

Shadyside, Ohio—Another large mine is to be opened in Belmont County within the next few weeks. The Cambria Coal Co. owned by the George M. Jones Coal Co., of Toledo, will open a mine on the Andrew Jackson Brown farm, southwest of Shadyside.

Johnstown, Penn.—The opening of new mines and other improvements by the Meyersdale Coal Co., at Friedens, is looked for as a result of the closing of a deal with F. F. Smith for the purchase of 120 acres of coal land for $11,000. It is close to the Stauffer bore and the Wellscreek mine.

Cardiff, Wales—Russia, Germany and Italy are placing unusually large orders for Welsh coal. The Russian order for 30,000 tons is to be sent to Odessa. This fact has attracted particular attention, since no Welsh coal has been sent to that port in many years, owing to the prohibitive import duty.

Hazard, Ky.—J. L. Coleman, of Knoxville, and J. P. Gorman, of Jellico, Tenn., are preparing to develop a tract of coal land up Messer branch, out of Hazard. They expect to be ready for operations by spring and to be in a position to ship 500 tons a day when the next season's coal trade opens up.

New Eagle, Penn.—B. S. Hammill Co., of Pittsburgh, broke ground Wednesday for a new coal mine on the Wallace farm, below New Eagle. Matthew Herron, who was formerly connected with the Monongahela River Coal Co., is to be superintendent, and B. S. Hammill, of Pittsburgh, general manager. The mine will be equipped with electricity.

Louisville, Ky.—The approach of winter has had the effect of checking operations in the way of development of new territory in the eastern part of the state, to a considerable extent. While the new mining settlements which have sprung up as a result of the great amount of territory opened during the past year are prospering, a lull during the winter months is expected.

Big Stone Gap, Va.—C. B. Slemp, of Big Stone Gap, Va., is interested with others in a tract of 30,000 acres of coal and timber land in Perry and Letcher Counties, Ky., the immediate development of which is under consideration. Details have been discussed, and it is reported that the preliminary work of installation of a number of mines will be started at once.

Rockwood, Penn.—James A. Kirkpatrick, for several years past superintendent of the Southern Coal Co.'s mines at Casselman, has leased a tract of coal land from the Brandenburg Coal Co., near Rockwood, along the B. & O. R.R., and has already begun a new mine opening. The lease also includes the old Pennwood Coal tipple and siding, which will be used for loading purposes.

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son. Slack is likely to rule much higher this winter in proportion to mine-run than has been the case in recent winters. There is some variation in circular prices, covering shipments over a year, the Pittsburgh Coal Co. having a circular at $1.30 for mine-run, with screened coal in proportion, while some others quote on a $1.25 basis for mine-run, holding nut at the same figure, while the large interests put nut at $1.25, or 5c. below mine-run. We quote the general asking market as follows: Nut, $1.25; mine-run, $1.25@1.30; ¾-in., $1.35@1.40; 1¼-in., $1.50@1.55; slack, 90 cents.

Connellsville Coke—Prices show no material change as regards prompt coke, but seem to be higher on contract. It is claimed that a large block of prompt furnace sold last week at $3.90, but as a rule $4 is the minimum, with occasional buyers at $4.25. Foundry coke is bringing scarcely more than furnace coke, but box cars are so scarce that many operators are refusing to guarantee box cars, and thus one of the distinctions between foundry and furnace coke is lost. Coke, indeed, is so scarce that many distinctions have disappeared, and in foundry coke it is largely a question of brand. It is understood that the $3.50 asking price on furnace coke on first-half contracts has been paid in one instance, involving about 10,000 tons a month, and that $3 has been paid on one or two contracts over the whole year. There is little furnace coke for next year not under contract, while a number of consumers are uncovered. We quote: Prompt furnace, $4@4.25; contract furnace, first half, $3.25@3.50; contract furnace, whole year, $3@3.25; prompt foundry, $4@4.50; contract foundry, $3.25@3.50.

Production for the Connellsville region is given under "Production and Transportation Statistics."

Philadelphia, Penn.

Conditions in this city, as regards the anthracite trade, seem to be growing worse as the winter season approaches. Assurances were held out earlier in the fall that by the time cold weather had reached this locality the situation would improve so that dealers would be able to secure supplies, but as a matter of fact, this prediction is far from being correct.

Everyone understands the situation, as it is explained to them time after time, but explanations do not go very far toward filling orders. The domestic sizes are still leading, and pea coal is now coming into prominence. This latter is used to a great extent as a domestic coal in this market, and during the winter months, is quite frequently far behind requirements. It is understood, however, that the large companies have considerable of this coal in stock, on which they are now drawing, and the supply is not likely to tighten up until after the first of the year. The price at retail is $5.25 to $5.50 per gross ton, and wholesale $2.50 at the mines.

Baltimore, Md.

Owing to the freer movement to tidewater, spot business again made its appearance during the past week, and the low grades brought $1.65 or better. Shipping conditions on the Western Maryland showed a vast improvement during the week, and there were fewer delays to traffic than for months past. At the company's Port Covington piers, three vessels were loaded during the week, two destined for Boston and one for Cuba, the coal being delivered by the Davis Coal & Coke Company.

The announcement has been made that the Russian Government has turned to this country for 750,000 tons of coal, and some of the local companies will endeavor to land a portion of this tonnage. The demand for coke continues unabated. Operators are receiving $4.50 per ton for the product, and it is scarce at that.

Buffalo, N. Y.

No slacking off of the activity in the coal trade is yet visible, either in anthracite or bituminous, and none is likely so long as cars are so scarce. It is reported that certain large consumers of bituminous are able to obtain only about half as many cars as they need, and it is safe to infer that smaller concerns are still more badly off. It is supposed that the closing of the Lake trade will release a large number of cars, but so long as coal shippers in the Pittsburgh district are paying a premium for bituminous coal to be shipped up the Lakes, there will be plenty of activity.

Bituminous coal does not advance in price now, but coke is still going steadily up. Quotations are $3.15 for Pittsburgh select lump, $3 for three-quarter, $2.85 for mine-run and $2.45 for slack, with Allegheny Valley about 25c. lower. Coke is especially active at $6.50 for best Connellsville foundry, some jobbers making still higher figures.

In anthracite there is a temporary lull on account of the mild weather. The output has rapidly gained on the consumption for some time, but the agitation on the subject in the press has caused consumers to ask a full season's supply at once and the actual surplus is as yet too small to meet that sort of demand.

Columbus, Ohio

The coal trade in Ohio shows but little change from the previous week. The car situation is still bad and probably worse than last week when there were indications of an improvement; this was only short lived, however, and the shortage is now as bad as at any time during the present season. The list price announced about the first of November is being well maintained and every change is toward higher levels. Dealers are now overwhelmed with orders. The cold snap of the past few days caused a rush for coal and in many cases stocks were not sufficiently large to meet the demand, and as a result many orders were only partially filled. Dealers' stocks are light and every effort to accumulate has been unsuccessful because of the short car supply.

The Lake trade is as active as could be expected under the circumstances. The season is fast waning and dockmen of the Northwest are urging as large shipments as possible before navigation closes. Production in the Ohio fields has been cut down to between 35 and 40 per cent. during the past week. In the Hocking Valley field where the car supply is probably the best the production is estimated at about 45 per cent. In other districts, especially Eastern Ohio and Pomeroy Bend the production has been about 35 per cent.

Quotations in Ohio fields are:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump	$2.25		$2.35	$2.25
2-in.	2.00	$1.60	2.00	2.00
Nut	1.75		2.00	
Mine-run	1.75	1.50	1.75	1.75
Nut, pea and slack	1.15		1.25	1.10
Coarse slack	1.00	1.25	1.00	1.00

Hampton Roads, Va.

A shortage of coal, the like of which has not been on record for years, prevails at Hampton Roads this week. While last week vessels were on hand for approximately 100,000 tons of coal, this week finds an even larger fleet, aggregating nearer 150,000 tons.

In view of the large tonnage lost on account of the election-holiday week, the reaction is not so bad after all. Of course, shippers are compelled to apply practically all their coal on contracts and are unable to take advantage of the attractive offers made for spot coal. The Lake season closes during the coming week, and New River and Pocahontas shippers have been pushed by their Western connections to complete contracts, etc., at the last moment, resulting in an additional drain on the tide-water market.

Birmingham, Ala.

There has been no material change in this district during the past week, so far as the car situation is concerned. Many of the mines are closed down two or three days each week for want of equipment, and this has naturally produced a feeling of unrest among some of the miners. The scramble for domestic coal continues

and the dealers view the outlook with considerable alarm.

Nut coke for domestic purposes has been marked up from $2 to $2.50, with practically all the available supply sold to Jan. 1.

Louisville, Ky.

No section of Kentucky or Tennessee seems to be receiving more than 50 per cent. of the cars required, if that much. The shortage still appears to be affecting western Kentucky operators most seriously. Several of the local yards, with mines in that section, state that they have been unable to obtain coal from mines other than their own. Even the railroads have begun to evince some anxiety over the situation, notwithstanding the advantage which they have in obtaining coal. Several lines operating in Kentucky have written more or less urgent letters to the coal men under contract with them, complaining that they are not receiving as much coal as they were entitled to.

The best grades of Eastern Kentucky lump have been selling around $2.75, when they could be had. Good Jellico block is quoted at $2.50@2.65; Jellico lump, $2.40@2.50; No. 2 run-of-mine, $1.10; steam grades, $1, and nut and slack, 75@90c. In view of the conditions existing in eastern Kentucky, no quotations whatever can be had for immediate deliveries from that section.

Indianapolis, Ind.

Some of the Indiana mines are putting in full time and all of them would be, if it were not for car shortage. Operators here are not benefitting as they should from the shortage of anthracite and Eastern bituminous coals. If Indiana mines could obtain sufficient equipment business would be 25 to 33 per cent. larger than usual at this time of year.

Operators are benefitting from the higher prices they are getting, as a consequence of the car shortage and the greater urgency of the demand. The following are wholesale quotations, f.o.b. mines:

No. 4 mine-run	$1.25
Nos. 5 and 6 mine-run	1.15
No 4 steam lump, 1¼-in	1.50
Nut, No. 4	1.60
Egg	1.60
Domestic lump 2½-in	1.85
Domestic lump 5- and 6-in	2.00
Screenings, No. 4	0.95
Screenings No. 5 and 6	0.85
Washed coal, Nos. 1 and 2	2.00
Brazil block	2.60

The f.o.b. Indianapolis prices are 50c. higher. The mine prices may be shaded 10c. by some operators, whose stocks have accumulated.

Shipments of anthracite to this city have practically ceased and dealers say they hardly know where to turn to obtain any. Until the situation is relieved, they are restricting sales to one ton of pea, nut or stove to one family, two tons of egg, or one ton combined of any two sizes. They say they do this, notwithstanding the added trouble and expense, so that every user may have some hard coal, and to prevent further advances in price.

Detroit, Mich.

Bituminous—The market is gradually declining and so far as can be ascertained none of the large users are suffering. However, operators are not accepting contracts, but are waiting until the coal arrives, then sell it for spot shipment at the prevailing market.

The car shortage still remains acute, and because of this fact the local operators are much discouraged. The allotment of cars is limited and the labor conditions at the mines seem as bad; the miners are leaving many sections in West Virginia because the work has been so slack. Unusually heavy shipments of Ohio coal are passing this port for the North.

The prevailing market prices for today are as follows:

	W.Va. Splint	Gas	Pocahontas	Hocking	Jackson Hill
Lump	$1.60		$2.75	$1.80	$2.40
Egg	1.60		2.75	1.80	2.40
Nut	1.50				
¾ lump		$1.25		1.20	
Mine-run		1.20	1.60	1.25	
Slack		1.00	1.30	1.00	

Anthracite—This is being quoted at $1.75 above circular, but there is little sold at this high price. Jobbers are holding off buying until Lake navigation closes and it is predicted that the price will drop at that time.

Chicago

The Chicago trade continues firm, and it is the belief of many observers that as soon as cold weather begins the market will advance rapidly. Continued improvement in general business conditions has resulted in prices for screenings reaching the highest level of the year. The present strength of the market is attributed by many to the shortage of anthracite and Hocking coal. Smokeless and coke have not supplied the continued demand, and there has been a heavy call upon Indiana and Illinois coals.

The Illinois Central and Chicago and Eastern Illinois roads are furnishing about 40 per cent. of the coal cars needed. Other lines, however, are making a much better showing, and it can be said that the car situation in this territory has improved about 15 per cent.

At the mines, smokeless mine-run commands $1.40 to $1.50, and lump and egg is firm at $2.60 to $2.75. The coke situation has been relieved to some extent by a better car supply. It is almost impossible to get Connellsville or Wise County coke here.

Prevailing prices at Chicago are:

	Sullivan Co.	Springfield	Clinton	West Va.
4-in. lump	$2.87			
Domestic lump		$2.82	$2.77	
Egg	2.87			$4.55
Steam lump		2.12	2.27	
Mine-run	2.32@2.42	1.97	2.17	3.55
Screenings	1.62@1.67	1.57	1.52	

Coke—Prices asked for coke are: Connellsville, $6.75@7; Wise County, $6.75@7; byproduct, egg and stove, $5.75@6; byproduct, nut, $5.75@6; gas house, $6.

Minneapolis—St. Paul

Many consumers at this point will have to substitute different grades and kinds of coal and coke in place of anthracite, as it is utterly impossible to bring sufficient of the latter to the docks at the head of the Lakes to supply the normal requirements.

The Illinois mines are working better time than during the past month or two, which indicates that the car supply has improved a little. Prices are holding firm and are not suffering much because of the mild weather. Franklin county producers are asking as high as $2.50 for lump, egg and nut, while Carterville district coal is bringing from $2 to $2.25. Harrisburg and Springfield district coals are selling for from $2 to $2.15 for the same sizes. Some Carterville men say they are prepared to make immediate shipments, and if the present weather keeps up it will not be long before all operators will be caught up with their orders in Illinois.

There is not very much coke to be had in this market and buyers are told it will be impossible to obtain any until along after the first of the year, as all ovens are sold up to that time.

Coal men in the Twin Cities and surrounding territory are much interested in the report that the Pere Marquette Ry. contemplates withdrawing coal rates by car-ferry to Milwaukee and points beyond. The Chesapeake & Ohio and the Baltimore & Ohio roads, which lines carry the bulk of the Splint and Pocahontas all-rail coal into this territory, have already filed a copy of the published tariff, effective Nov. 25, and coal men are writing and wiring the Interstate Commerce Commission to defer action until they can have an opportunity of being heard.

St. Louis, Mo.

The market here is rather weak, and unless we have some real cold weather, indications are that it will continue slow. There is still a car shortage, which accounts for the prices holding up as they are, but the continued warm weather has caused a falling off in the demand.

Anthracite is about as scarce as ever, and smokeless is in fairly good demand

with very little coming. Gas house and byproduct coke are strong and hard to get.

The prevailing prices are:

Carterville and Franklin County	
6-in. lump	$1.85@2.00
3x6 egg	1.80@1.90
No. 1 nut	1.60@1.70
No. 2 Nut	1.40@1.50
2-in. screenings	0.85
No. 1 washed	2.00
No. 2 washed	1.65
No. 3 washed	1.35
No. 4 washed	1.05
No. 5 washed	0.85
Murphysboro Big Muddy	
Lump and egg	$2.25
Trenton	
Lump and egg	$2.40
Mount Olive	
6-in. lump	$1.65@1.75
3-in. lump	1.40@1.50
Standard	
6-in. lump	$1.35@1.40
2-in. lump	1.00@1.10
Screenings	0.40@0.45

Ogden, Utah

The car shortage has now been relieved, and, commencing with November, all the mines have received sufficient equipment to keep the plants operating full time. As the weather conditions over the entire West are normal, with no excessive low temperatures, the public in general is able to receive prompt delivery. This continued warm weather and sufficient cars at the mines has allowed the larger operators to catch up somewhat on their unfilled orders, especially the nut grade. Salesmen have been sent out in order to stimulate shipments on nut coal.

Wyoming coals take a slight increase on Nov. 15 in territory east of Wyoming.

Prices in territory west of Wyoming remain unchanged as follows:

	Wyoming	Utah	F.o.b. Mines
Lump	$2.75	$2.75	$2.75
Nut	2.25	2.25	2.50
Run of Mine	1.85	1.85	1.85
Slack	1.00	1.25	1.00

Production and Transportation Statistics

The Car Situation

The following table shows the surplus and shortages of cars on 182 roads on Nov. 7:

	Surplus	Short	Net Surplus
Box	2,632	46,463	*43,831
Flat	1,551	5,164	*3,613
Coal, gond. and hopper	7,262	14,811	*7,549
Other kinds	8,452	4,718	3,734
Total	19,897	71,156	*51,259

*Shortage.

On the corresponding date last year the net surplus of idle cars was 26,514. Two years ago it was 34,581, in 1900 a shortage of 3286, and in 1908 a surplus of 109,515.

In the past years the maximum shortage has usually occurred in the last week of October. The crop-moving period set in a little later than usual this year, and the tide of merchandise business has been steadily rising until recently, so that it would not be surprising if the next fortnightly statement, to be made up as of Nov. 21, showed a still further increase in the scarcity of equipment. The small change in the latest bulletin indicates, however, that the peak has been almost reached.

Imports and Exports

The following is a comparative statement of imports and exports in the United States for the first nine months of 1911-12, and for September of the current year, in long tons:

	9 months 1911	1912	September
Imports			
Anthracite	20*	1,030*	1,000*
Bituminous	928,311	1,185,634	160,246
Coke	55,958	69,572	8,416
Exports			
Anthracite	2,625,582	2,601,631	415,301
Bituminous			
Canada	7,659,378	7,766,198	1,070,188
Panama	387,976	362,277	50,050
Mexico	401,936	239,402	14,841
Cuba	740,349	851,389	93,754
West Indies	416,212	506,624	26,214
Other countries	519,021	1,257,403	59,894
Total Bit.	10,124,872	10,983,293	1,314,941
Bunker Coal	5,012,097	5,495,719	551,310

*Figures cover period since July 1.

Connellsville Coke

The *Courier* reports production in the Connellsville region as follows:

Production	Week Ending Nov. 16	Nov. 23
Connellsville	210,000	218,628
Lower Connellsville	189,142	181,990
Total	399,142	400,618
Shipments To	Cars	Cars
Pittsburgh	4,085	4,059
West of Pittsburgh	6,755	6,728
East of Region	923	1,010
Total	11,763	11,797

Foreign Markets

Spanish Imports

The following is a comparative statement of Spanish imports for the first eight months of this year and last year:

	1911	1912
Coal	1,398,060	1,486,111
Coke	206,454	242,355

Russia

Consular reports indicate a marked falling off in the annual Russian coal output for 1911, which totalled 18,520,100 long tons as compared with 22,781,700 tons for the previous year. The production in former years was: 24,158,000 tons in 1909; 24,673,000 tons in 1908; 22,494,000 tons in 1907 and 19,695,000 tons in 1906. Of the 1911 output 2,088,800 tons represented the anthracite production and 16,431,300 the bituminous. These figures are exclusive of the annual production of coal in Siberia where in 1910 there was 1,161,300 tons produced as against 627,400 mined in 1909. The greatest activity in this section was in the large private and government mines in Eastern Siberia.

Peru

According to the latest official statistics the production of coal in Peru during 1910 totalled 307,320 tons, as compared with 321,502 tons in 1909, 311,122 tons in 1908, 185,565 tons in 1907, and 79,969 tons in 1906. The imports of coal into Peru during 1910 totalled 97,023 tons.

Financial Notes

The following table gives the range of various active coal securities and dividends paid during the week ending Nov. 16:

Stocks Company	High	Low	Last
American Coal Products	94	94	94
American Coal Prod. Pref.	111	111	111
Col. Fuel & Iron	37⅛	35	36⅛
Consolidation Coal of Md.	103¾	103¼	103⅜
Island Creek Coal	60	57	58⅝
Lehigh Valley Coal Sales	235	240	240
Pittsburg Coal	24	23	23⅝
Pittsburg Coal Pref.	93	91½	92½
Pond Creek	27⅜	26½	27⅛
Reading	172⅝	168⅝	172
Reading 1st. Pref	90¾	90	90⅛
Reading 2nd. Pref	96	96	96
Virginia Iron C. & C	65½	65	65½

Bonds Company	Closing Bid	Asked	Weeks Range or Last Sale
Colo. F. & I. gen. s f g 5s	....	100	98⅜ Sept. '12
Colo. F. & I. gen. 6s	108	108½	107¼ June '12
Col. Ind. 1st & coll. 5s. gu.	83½	Sale	83¼ 84⅛
Cons. Ind. Coal Mc. 1st 5s.	....	84	85 June '11
Cons. Coal 1st and ref. 5s.	....	94	93 Oct. '12
Gr. Riv. Coal & C. 1st g 6s.	96	100	102⅜ Apr. '06
K. & H. C. & Co. 1st s f g 5s.	98	....	98 Oct. '12
Pocah. Con. Coll. 1st. s f 5s.	85	88	87⅜ Nov. '12
St. L. Rky. Mt. & Pac. 1st 5s.	79¾	82	80 Sept. '12
Tenn. Coal gen. 5s	100⅜	101⅛	101½ 101⅜
Birm. Div. 1st consol. 6s.	102¼	Sale	102⅜ 102⅛
Tenn. Div. 1st g 6s	102	103¾	102¾ Oct. '12
Cah. C. M. Co. 1st g 6s.	103½	110	110 Jan. '09
Utah Fuel 1st g 5s	....	....	....
Victor Fuel 1st s f 5s	....	85½	85¼ Oct. '12
Va. I. Coal & Coke 1st g 5s.	97	97½	97½ Nov. '12

No important dividends were declared during the week.

Great Lakes Coal Co. (Pittsburgh)—This company, on Oct. 1, defaulted payment on its first mortgage and collateral trust 5 per cent. bonds, aggregating $2,181,000 outstanding, including $325,000 pledged as collateral. The notes and accounts payable aggregated about $527,000.

Cape Breton Coal, Iron & Railway Co. (Ltd.)—This company owns about 80 square miles of land which is estimated to contain 700,000,000 tons of merchantable coal. In the Broughton seam which is opened out, equipped and ready for working, the company has about 163,000,000 tons.

Pittsburgh Coal Co.—The $25,000,000 first and collateral fives of 1904 issued by this company are guaranteed. They are a first lien on 100,000 acres of coal land and 13,000 acres of surface and by collateral trust on 7000 acres of Hocking Valley coal, and 8400 acres of Pittsburgh coal held under leases, and deposits of all securities owned. A sinking fund of 5c. per ton on mine-run coal with a yearly minimum of $600,000 is provided.

Clinchfield Coal Corporation—There are on the property of this company four large basins containing at least 400,000,000 tons of mineable and marketable coal under present operating conditions; this has been proved by more than 1000 prospects and more than 150 diamond drill tests. Two diamond drills are now engaged on the upper branches of the Big Sandy River contiguous to the already developed areas.

Reading Coal & Iron Co.—The company's earnings of 10.57% for the fiscal year ended June 30, 1912, are the lowest recorded for four years. Earnings for the common stock before the sinking fund requirements of 5c. per ton of anthracite mined and addition and betterment expenditures, but after 4% on each of the classes of preferred stock, were equal to 11.3% as compared with similar earnings of 12.1% in 1911, 14.3% in 1910 and 11.5% in 1909.